

MATERIALS TOWARD A MONOGRAPH OF THE GENUS VERBENA. XII

Harold N. Moldenke

VERBENA L.

Additional & emended bibliography: Tragus, *Stirp. Germ.* 210 & 211. 1552; Dodon., *Stirp. Hist. Pemptad.*, ed. 1, 149—151. 1583; Gesner, *Stirp. Collect.* 113. 1587; L'Obel, *Icon. Stirp.* 534—535. 1591; Gerarde, *Herbal* 580—582, fig. 1 & 2. 1597; Clus., *Rar. Plant. Hist. Stirp.* 2 ["4"]: xlv—xlvi. 1601; Dodon., *Stirp. Hist. Pemptad.*, ed. 2, 149—151. 1616; Kniphof, *Orig. Cent.* 12: no. 98 & 99. 1764; Kniphof, *Herb. Viv.* 2: 1155—1158. 1764; Poir. in Lam., *Encycl. Méth. Bot. [Illustr. Gen.]* 1: 57, pl. 17, fig. 1 & 2. 1791; Vahl, *Enum. Pl.* 1: 207—208. 1804; Raf., *Med. Repos.*, ser. 2, 5: 352 & 360. 1808; Raf., *Journ. Bot. (Paris)* 2: 170. 1808; Raf., *Journ. Bot. (Paris)* 1: 228. 1809; Sims in Curtis, *Bot. Mag.* 45: pl. 1976. 1818; Raf., *First Cat. Bot. Gard. Transylv. Univ.* 16. 1824; Torr., *Ann. Lyc. Nat. Hist. N. Y.* 2: 234. 1827; Lehm., *Nov. & Minus Cog. Stirp. Pug.* 1: 37. 1828; Lehm., *Nov. Act. Acad. Caes. Leopold.* 14: 824. 1828; Raf., *Atl. Journ.* 1: 146 & 154. 1832; Reider, *Ann. Blumistereii* 8: [pl. 12]. 1832; Raf., *Herb.* Raf. 50, 61, 65, & 69. 1833; Jacq., *Annal. Flore & Pomme* 1836: 56—57, pl. 8. 1836; Ascherson in G. Schweinf., *Beitr. Fl. Aethiop.* 120 & 278. 1867; R. A. Phil., *Anal. Univ. Chile* 35: 190—192. 1870; Lorentz, *Veg. Nordeste Prov. Entre Rios*, ed. 1, 86, 87, 107, 150, 165, 167, & app. iv. 1878; Batt. & Trab., *Fl. Alg.* 1: 716—717. 1888; Hook. f. & Jacks., *Ind. Kew.* 2: 895, 1161, 1178—1180, & 1248. 1895; N. L. Britton, *Man.* 778. 1900; Fiori & Paoletti, *Icon. Fl. Ital.* 2: 380, fig. 3219. 1902; Dusén, *Arch. Mus. Nac. Rio Jan.* 13: 36 & 94. 1903; Schaffner, *Ohio Nat.* 7: 31—34. 1906; Blewitt, *Rhodora* 13: 89. 1911; Gerth van Wijk, *Dict. Plantnames* 1: 1398 (1911) and 2: 228, 478, 655, 893, & 1492. 1916; J. H. Schaffner, *Ohio Journ. Sci.* 21: 133. 1921; R. E. Arnold, *Gard. Chron.*, ser. 3, 76: 245. 1924; S. Arnott, *Gard. Chron.*, ser. 3, 76: 267. 1924; "C.", *Gard. Chron.*, ser. 3, 76: 279, fig. 99. 1924; Trivetts, *Cat.* 1932; Wadmond, *Rhodora* 34: 19. 1932; Trivetts, *Cat. Suppl.* 1933 Novelty List 6. 1933; Truman, *Rhodora* 40: 244—245. 1938; N. F. Petersen, *Amer. Bot.* 45: 166—167. 1939; Monod, *Phanerogames in Contrib. Etude Sahara Occident.* 2: pl. 22. 1939; Off. Org. Malayan Agr.—Hort. Assoc. Kuala Lumpur 10: 152. 1940; H. E. Stone, *Fl. Chester Co.* 1123—1126 & 1470. 1945; Tryon & Moore, *Rhodora* 48: 115, 116, & xiv. 1946; Deam, Kriebel, Yuncker, & Friesner, *Proc. Ind. Acad. Sci.* 55: 56. 1946; E. D. Merr., *Ind. Raf.* 205 & 295. 1949; C. Skottsberg, *Medd. Göt. Bot. Trädg.* 18: 151. 1950; Acevedo de Vargas, *Bol. Mus. Nac. Hist. Nat. Chile* 25: 50—70. 1951; H. C. Greene, *Am. Midl. Nat.* 48: 52. 1952; H. C. Greene, *Biol. Abstr.* 27: 1885. 1953; *Biol. Abstr.* 27: 3735 & 3768. 1953 [not "1955"]; Peter Pauper Press, *Little Limerick Book* 56. 1955; Hocking, *Dict. Terms Pharmacog.* 240 & 284. 1955; Martínez Crovetto & Rojo, *Revist. Invest. Agric.* 11: 129. 1957; Mat-

toon, Pl. Buyers Guide, ed. 6, 287--288. 1958; Lundell, Wrightia 2: 47. 1960; P. Jaeger, Wonderf. Life of Fls. 124. 1961; Zohary, Pl. Life Palest. 164. 1962; Soukup, Biota 4: 191. 1962; Angely, Fl. Bacia Paran. 22: 39. 1962; Nair & Rehman, Bull. Nat. Bot. Gard. Lucknow 76: 3--4. 1962; Moldenke, Résumé Suppl. 6: 1--11. 1963; Vaughan's Gard. Illustr. 87:45, 57, & 67. 1963; Gleason & Cronquist, Man. Vasc. Pl. li, 579--581, 807, & 808. 1963; Park's Flower Book 1963: 39, fig. 2043, 2058, & 2060. 1963; Pelletized Seed Co., seed packet P.4370. 1963; Raven, Aliso 5: 299, 336, & 392. 1963; Haggerty, Our Parks 29 (1): 1. 1963; B.A.S.I.C. 43 (2): B.112 (1963) & 43 (4): B.110. 1963; Assoc. Etude Taxon. Fl. d'Afr. Trop. Index 1962: 63. 1963; Coon, Using Pl. for Heal. 220. 1963.

Additional excluded species:

Verbena alba in locis umbrosis, flor. Iul. Gesn. -- in the Lamiaceae

Verbena altera fuchsii Gesn. -- in the Lamiaceae

Verbena, floret August. & Sept. semen fert. Octob. Gesn. -- in the Lamiaceae

Verbena foemina seu supina fuchsii Gesn. -- in the Lamiaceae

Verbena lutea fuchsii Gesn. -- in the Lamiaceae

Verbena quaedam rarior (è provincia) pulchrior & maioribus floribus, si benè me mini, floret Iul. Gesn. -- in the Lamiaceae

Soukup (1962) refers to this genus as "China verbena", but in all probability it is merely xv. hybrida Voss to which he is here referring.

The Collector undesignated s.n. [ex Chili] distributed as Verbena sp. in the Lund herbarium is actually Phyla nodiflora var. rosea (D. Don) Moldenke, Oemler s.n. [1837] is Persicaria hirsuta (Walt.) Small in the Polygonaceae, and D. S. Correll 26588 is not verbenaceous.

Nair & Rehman (1962) give an interesting "key" for the identification of five species of this genus by their pollen-grains:

1. Ectine surface granulate.
2. Endocolpium faint.....V. phlogiflora Cham.
2. Endocolpium clear (lalongate).....V. bonariensis L.
3. Longest diameter of endocolpium 12--16.8 μV. officinalis L.
- 3a. Longest diameter of endocolpium below 10 μV. rigida Spreng.
- 1a. Ectine surface psilate....."V. pinnatifida".

Since they later state that the endocolpium of V. bonariensis is "5.6 x 16.8 μ ", it is not clear how they expect the above "key" to be used. To what they are referring by "V. pinnatifida" is also not clear -- perhaps to V. tenuisecta Briq.

Full explanation of the abbreviations and symbols used for the names of the 269 herbaria in which Verbena material herein cited

is deposited is given in PHYTOLOGIA 5: 154--159 (1955), 6: 242 (1958), 7: 91--92 (1959), 7: 123--124 (1960), 7: 343 (1961), and 8: 95 (1961), with the following additions: Ag = Carlos Muffos Herbarium, Ministerio de Agricultura, Santiago, Chile; Am = Southwest Research Station, American Museum of Natural History, Portal, Arizona; Hi = University of North Carolina, Chapel Hill, North Carolina; Hr = H. Hürlimann Herbarium, CIBA, Basel, Switzerland; Jz = J. de J. Jiménez Herbarium, Santiago de los Caballeros, Dominican Republic; Og = P. Olrog Herbarium; Pm = Pharma Herbarium, CIBA, Basel, Switzerland; Rf = Texas Research Foundation, Renner, Texas; Ul = Centro de Botanica, Junta de Investigações de Ultramar, Lisbon, Portugal; and Ws = University of Wisconsin, Madison, Wisconsin.

VERBENA ABRAMSI Moldenke

Additional bibliography: Moldenke, Phytologia 8: 378 & 396 (1962) and 8: 460. 1963; Moldenke, Résumé Suppl. 6: 3. 1963.

Howell reports the stems prostrate and rooting, the inflorescences ascending.

Additional citations: CALIFORNIA: Monterey Co.: J. T. Howell 40039 (Z).

VERBENA ALATA Sweet

Additional bibliography: Moldenke, Phytologia 8: 146--148 (1961), 8: 379 & 397 (1962), and 8: 460. 1963.

The Sellow specimen represented by Macbride's photograph 17399 was in the Berlin herbarium before World War II and is now destroyed.

Additional citations: BRAZIL: State undetermined: Sellow s.n. [Macbride photos 17399] (N--photo). URUGUAY: Collector undesignated s.n. [Monte Video] (Lu).

VERBENA AMBROSIFOLIA Rydb.

Additional bibliography: Moldenke, Phytologia 8: 379 & 397--399 (1962) and 8: 460--461. 1963; Moldenke, Résumé Suppl. 6: 3, 4, 8, & 10. 1963.

Additional citations: TEXAS: Jeff Davis Co.: A. R. Moldenke 648 (S). Pecos Co.: A. R. Moldenke 649 (S), 650 (S). NEW MEXICO: Lincoln Co.: A. R. Moldenke 637 (S), 638 (S). Otero Co.: A. R. Moldenke 640 (S), 642 (S); Moldenke & Woods 606 (S), 608 (S).

VERBENA AMBROSIFOLIA f. EGLANDULOSA Perry

Additional bibliography: Moldenke, Phytologia 8: 379 & 399--400. 1962; Moldenke, Résumé Suppl. 6: 3. 1963.

Additional citations: NEW MEXICO: Hidalgo Co.: A. R. Moldenke 780 (S). Luna Co.: A. R. Moldenke 630 (S). ARIZONA: Cochise Co.: A. R. Moldenke 782 (S), 784 (S); Moldenke & Woods 611 (S), 613 (S).

VERBENA ARAUCANA R. A. Phil.

Additional bibliography: Acevedo de Vargas, Bol. Mus. Nac. Hist. Nat. Chile 25: 50. 1951; Moldenke, Phytologia 8: 379. 1962.

VERBENA ARISTIGERA S. Moore

Additional bibliography: Moldenke, *Phytologia* 8: 189--191 & 400 (1962) and 8: 461. 1963; Moldenke, *Résumé Suppl.* 6: 7 & 8. 1963.

The Moore specimen represented by Macbride's photograph 17403 was in the Berlin herbarium before World War II, but is now destroyed.

Additional citations: BRAZIL: Matto Grosso: S. Moore 1083 [Macbride photos 17403] (N--photo of type).

VERBENA ATACAMENSIS Reiche

Additional bibliography: Acevedo de Vargas, *Bol. Mus. Nac. Hist. Nat. Chile* 25: 51. 1951; Moldenke, *Phytologia* 8: 379 & 400. 1962.

VERBENA BALANSAE Briq.

Additional citations: BRAZIL: Santa Catarina: Reitz C.883 (N).

VERBENA BARBATA Grah.

Additional bibliography: Moldenke, *Phytologia* 8: 201. 1962; Moldenke, *Résumé Suppl.* 6: 10. 1963.

VERBENA BERTERII (Meisn.) Schau.

Emended synonymy: Shuttleworthia berterii Meisn., *Pl. Vasc. Gen.* 2: 198. 1839.

Additional & emended bibliography: Hook. f. & Jacks., *Ind. Kew.* 2: 895 & 1178. 1895; Acevedo de Vargas, *Bol. Mus. Nac. Hist. Nat. Chile* 25: 51--52. 1951; Moldenke, *Phytologia* 8: 380--381 & 401 (1962) and 8: 461--462. 1963.

Material of this species has been misidentified and distributed in herbaria as V. radicans Gill. & Hook. On the other hand, the Skottsberg & Skottsberg 843 cited by me in *Phytologia* 8: 205 is actually V. sulphurea D. Don, as is also the Bridges s.n. [Chile] distributed as "V. erinoides Hook."

Additional citations: CULTIVATED: Sweden: Collector undesig-nated s.n. [H. H. Loc. 1837] (Lu).

VERBENA BIPINNATIFIDA Nutt.

Additional synonymy: Verbenia bipinitifida Walker, in herb.

Additional bibliography: Mattoon, *Pl. Buyers Guide*, ed. 6, 287. 1958; Moldenke, *Phytologia* 8: 230--242, 381, & 401--404 (1962) and 8: 462. 1963; Gleason & Cronquist, *Man. Vasc. Pl.* 579 & 581. 1963; Moldenke, *Résumé Suppl.* 6: 3 & 10. 1963; Park's *Flower Book* 1963: 39. 1963.

The species is described by Park (1963) as "a showy 15 inch everblooming perennial in lavender-blue with lovely fern-like foliage" and is sold by him at the rate of 100 seeds for 25 cents; 200 for 45 cents. Seeds are also available to the horticultural trade from Thompson & Morgan (England), Vaughan's (New York & Chicago), American Perennial Gardens (Garden City, Mich.), Pearce (Moorestown, N. J.), and Saier (Dimondale, Mich.). An

additional common name is "fern verbena". Gould describes the corollas as light-violet and found the plant in disturbed black rocky soil; Gould & Hycka found it in open oak-mesquite woods; Warnock describes the species as "infrequent and widespread" in Val Verde County, Texas; Powell & Edmondson refer to it as "infrequent" on prairies in Durango.

The F. W. Pond 27, distributed as V. bipinnatifida, is actually V. canadensis (L.) Britton; Fleetwood 3444 is V. ciliata var. longidentata Perry; Hayes 610 is V. pumila Rydb.; and C. Jackson 184 is V. tenuisecta Briq.

Additional citations: KANSAS: Smith Co.: W. H. Horr E.108 (Au-121735). ARKANSAS: Hempstead Co.: Demaree 44963 (S). OKLAHOMA: Choctaw Co.: Nelson, Nelson, & Goodman 5534 (Au-121733). Major Co.: Waterfall & Coryell 9921 (Au-121736). Murray Co.: Muncrief 72 (Au-121734). TEXAS: Bell Co.: Moldenke & Woods 583 (S). Bosque Co.: A. R. Moldenke 663 (S). Comanche Co.: A. R. Moldenke 659 (S); Moldenke & Woods 594 (S). Coryell Co.: Moldenke & Woods 588 (S). Dallas Co.: Lundell & Lundell 11315 (Au-198825, Ld). Ellis Co.: Moldenke & Woods 575 (S). Erath Co.: A. R. Moldenke 660 (S). Falls Co.: Moldenke & Woods 590 (S). Garza Co.: Moldenke & Woods 604 (S). Hartley Co.: York & Rodgers 336 (Au-201856). Hays Co.: J. W. Walker 42 (Au-197613). Hill Co.: Moldenke & Woods 568 (S). Jones Co.: N. C. Henderson 63-135 (Au). Kent Co.: Moldenke & Woods 605 (S). Lampasas Co.: Moldenke & Woods 592 (S). Lynn Co.: Moldenke & Woods 577 (S), 597 (S), 601 (S), 602 (S). McLennan Co.: Moldenke & Woods 579 (S). Menard Co.: A. R. Moldenke 656 (S). Oldham Co.: York & Rodgers 401 (Au-200967). Reagan Co.: A. R. Moldenke 653 (S). San Patricio Co.: Gould & Hycka 8042 (Au-194231). Schleicher Co.: A. R. Moldenke 654 (S). Shackelford Co.: N. C. Henderson 63-95 (Au-217645). Terry Co.: Moldenke & Woods 603 (S). Throckmorton Co.: F. W. Gould 9080 (Au-191040). Upton Co.: A. R. Moldenke 652 (S). Val Verde Co.: B. H. Warnock 11349 (Au-198457). ARIZONA: Cochise Co.: A. R. Moldenke 783 (S); Moldenke & Woods 612 (S). MEXICO: Coahuila: E. G. Marsh 1121 (Au-212919). Durango: Powell & Edmondson 961 (Au-193236).

VERBENA BIPINNATIFIDA var. LATILOBATA Perry.

Additional bibliography: Moldenke, Phytologia 8: 381 & 404-405 (1962) and 8: 462. 1963.

Additional citations: ARIZONA: Cochise Co.: Moldenke & Woods 610 (S), 614 (S), 615 (S). Santa Cruz Co.: A. R. Moldenke 622 (S). MEXICO: Michoacán: Hinton 13125 (Rf).

VERBENA BLANCHARDI Moldenke

Additional bibliography: Moldenke, Phytologia 8: 381-382 & 405 (1962) and 8: 462. 1963; Gleason & Cronquist, Man. Vasc. Pl. 580. 1963.

VERBENA BONARIENSIS L.

Additional & emended bibliography: Morong, Britton, & Vail, Ann. N. Y. Acad. Sci. 7: 197. 1893; Mattoon, Pl. Buyers Guide, ed. 6, 287. 1958; Nair & Rehman, Bull. Nat. Bot. Gard. Lucknow 76: 3-5, fig. 2. 1962; Maria, Pl. Vall. Coch. 38. 1962; Moldenke, Phytologia 8: 382-383 & 405-407 (1962) and 8: 463. 1963; Vaughan's Gard. Illustr. 87: 67. 1963; Gleason & Cronquist, Man. Vasc. Pl. 580. 1963; Moldenke, Résumé Suppl. 6: 6-8 & 10. 1963.

Additional illustrations: Nair & Rehman, Bull. Nat. Bot. Gard. Lucknow 76: 3, fig. 2. 1962.

Nair & Rehman (1962) describe the pollen-grains of this species as follows: "size 43μ (range $39-46\mu$). Endocolpium lalongate ($5.6 \times 16.8\mu$)" and cite Nat. Bot. Gard. 24619 from Almora (slide 2727), not as yet seen by me.

Vaughan (1963) offers this species to the horticultural trade as seed packet 8566A and describe it as "Tall, hardy verbena. Perennial.....4 ft. Sweet scented rosy lavender flowers on long stiff stems. Will flower first year from a March sowing. Start seed indoors and set small plants out when ground is sufficiently warm", selling it at 15 cents per packet.

Curtiss 1963 is a mixture — the part [1963*] from "sandy ridges bordering the ocean, eastern Florida" is V. maritima Small; the part [1963**] from "roadsides near Charleston" is V. bonariensis L.; and the part [1963] from "low open woods, Indian River, June" is V. tampensis Nash.

Maria (1962) cites his no. 182/4e from Cochabamba, Bolivia, not as yet seen by me.

The Dusén 14320 and Gould & Reeves 8227, distributed as V. bonariensis, are actually V. brasiliensis Vell., while O. Solís 70 is V. sphaerocarpa Perry.

Seeds of V. bonariensis are offered to the horticultural trade by Vaughan's (New York & Chicago), Burnett Brothers (New York), Roberts (Davington, Kent), Sutton & Sons (Reading), Thompson & Morgan (England), Watkins & Simpson (London), Homestead Nurseries (Boskoop), Hillier & Sons (Winchester), Pearce (Moorestown, N. J.), Saier (Dimondale, Mich.), and John Forbes (Hawick).

Additional citations: ALABAMA: Winston Co.: A. R. Moldenke 771 (S). MISSISSIPPI: Holmes Co.: A. R. Moldenke 754 (S). Jefferson Co.: A. R. Moldenke 740 (S). LOUISIANA: Beauregard Par.: A. R. Moldenke 709 (S). Bienville Par.: A. R. Moldenke 685 (S). Natchitoches Par.: A. R. Moldenke 698 (S). ARGENTINA: Buenos Aires: Collector undesignated s.n. [Buebos Ayres] (Lu). San Juan: Cuezzo 1077 (Rf). Tucumán: Bruch 2723 (N). CHILE: Valdivia: Hollermayer s.n. [Werdermann 1362] (N). TANGANYIKA: Faulkner 2231 (S). SOUTH-EAST RHODESIA: Fries, Norlindh, & Weimarck 2655 (Lu), 2847 (Lu), 4003 (Lu). CULTIVATED: England: Stearn s.n. [Moldenke & Moldenke 9160] (N).

VERBENA BRACTEATA Lag. & Rodr.

Additional synonymy: Verbena brevibracteata Eggert ex Prain, Ind. Kew. Suppl. 3: 187. 1908; Perry, Ann. Mo. Bot. Gard. 20: 338, in syn. 1933. Verbena bracteatum Lag. & Rodr., in herb.

Additional bibliography: Perry, Ann. Mo. Bot. Gard. 20: 342. 1933; Moldenke, Phytologia 8: 274—309, 383—384, & 407—412, fig. 5 (1962) and 8: 464. 1963; Moldenke, Résumé Suppl. 6: 1—3, 8, & 10. 1963; Gleason & Cronquist, Man. Vasc. Pl. 579—581. 1963.

Perry (1933) regarded Eggert's V. brevibracteata as a synonym of V. pumila Rydb. because the specimens he so identified are that species. He based his binomial, however, on Gray's V. bracteata var. brevibracteata and therefore his name has to go into the same synonymy as Gray's trinomial.

Cronquist found V. bracteata "on lake shore above present water level but well below highwater mark" in Oregon. Demaree reports it as "common" on low sandy ridges in Arizona. Rowell describes the corollas as "pale-purple" and found the plant in deep sand of dunes "locally abundant in disturbed area around prairie dog town". It has also been found in sandy soil, sandy loam, and on rolling prairies. Warnock calls it a "frequent annual prostrate in limestone depressions"; Wiggins & Wiggins found it growing with Xanthium and Distichlis "on soil flooded when reservoir is full"; Rowell states that it is "occasional" in sandy loam or tight sandy loam near cattle tanks.

The Correll & Johnston 21530 distributed as V. bracteata is actually V. gracilis Desf., while Waterfall 12703 is V. subuligera Greene

Additional citations: ALABAMA: Lawrence Co.: A. R. Moldenke 768 (S). ARKANSAS: Desha Co.: Demaree 45863 (S). COLORADO: Archuleta Co.: C. F. Baker 564 (Lu). Boulder Co.: Ewan, Pl. Exsicc. Gray. 1090 (Au—19864, Rf). TEXAS: Carson Co.: H. N. Moldenke 21883 (S). Culberson Co.: B. H. Warnock 14313 (Au—198201). Dallam Co.: C. M. Rowell 5384a (Au—195968), 5401a (Au—195986); Turner & Melchert 4800 (Au—209801); York & Rodgers 165 (Au—201685), 205 (Au—201744), 242 (Au—201831). Hemphill Co.: C. M. Rowell 4037 (Au—195200). Lipscomb Co.: C. S. Wallis 7240 (Au—210257). Lubbock Co.: C. M. Rowell 60-024 (Au—195352). Oldham Co.: H. N. Moldenke 21884 (S). NEW MEXICO: Catron Co.: A. R. Moldenke 628 (S). Otero Co.: A. R. Moldenke 641 (S). Sierra Co.: A. R. Moldenke 633 (S). Socorro Co.: A. R. Moldenke 634 (S). ARIZONA: Apache Co.: Demaree 44626 (S). Coconino Co.: Demaree 42147 (S). OREGON: Harney Co.: Cronquist 8570 (Au—207619, Mi, N). CALIFORNIA: Lassen Co.: Wiggins & Wiggins 16338 (Au—200548).

VERBENA BRASILIENSIS Vell.

Additional bibliography: Acevedo de Vargas, Bol. Mus. Nac. Hist. Nat. Chile 25: 52. 1951; Moldenke, Phytologia 8: 309—323, 384, & 412—414, fig. 6 (1962) and 8: 464—465. 1963; Moldenke,

Résumé Suppl. 6: 2 & 6. 1963; Gleason & Cronquist, Man. Vasc. Pl. 579. 1963.

Balls found this species in a cultivated field in California in association with Typha, Juncus, etc. Gould & Reeves found it on "open coastal prairie" in Chambers County, Texas, while Demaree reports it as "very common all along the coast" in Harrison County, Mississippi.

The specimen of Lorentz 131 which is represented by Macbride's photograph 20316 is deposited in the Munich herbarium.

Additional citations: ALABAMA: Etowah Co.: Moldenke & Woods 503 (S). Lawrence Co.: A. R. Moldenke 769 (S). Winston Co.: A. R. Moldenke 770 (S); Moldenke & Woods 505 (S). MISSISSIPPI: Adams Co.: A. R. Moldenke 735 (A). Attala Co.: A. R. Moldenke 755 (S). Choctaw Co.: A. R. Moldenke 760 (S). Claiborne Co.: A. R. Moldenke 742 (S); Moldenke & Woods 518 (S). Clay Co.: A. R. Moldenke 764 (S). Copiah Co.: Moldenke & Woods 519 (S). Harrison Co.: Demaree 29009 (Au—121835). Hinds Co.: Moldenke & Woods 520 (S). Holmes Co.: A. R. Moldenke 753 (S). Humphreys Co.: A. R. Moldenke 749 (S); Moldenke & Woods 514 (S). Issaquena Co.: A. R. Moldenke 748 (S). Itawamba Co.: Moldenke & Woods 509 (S). Jefferson Co.: A. R. Moldenke 737 (S); Moldenke & Woods 517 (S). Lee Co.: Moldenke & Woods 512 (S). Lowndes Co.: A. R. Moldenke 762 (S). Noxubee Co.: A. R. Moldenke 758 (S). Panola Co.: Moldenke & Woods 521 (S). Sharkey Co.: A. R. Moldenke 751 (S); Moldenke & Woods 515 (S). Warren Co.: A. R. Moldenke 747 (S); Moldenke & Woods 522 (S). Winston Co.: A. R. Moldenke 759 (S). YAZOO Co.: Moldenke & Woods 513 (S). ARKANSAS: Desha Co.: Demaree 45861 (S). LOUISIANA: Allen Par.: A. R. Moldenke 712 (S). Avoyelles Par.: A. R. Moldenke 721 (S). Beauregard Par.: A. R. Moldenke 706 (S). Bienville Par.: A. R. Moldenke 686 (S). Bossier Par.: A. R. Moldenke 677 (S); Moldenke & Woods 550 (S). Caddo Par.: Moldenke & Woods 552 (S). Caldwell Par.: Moldenke & Woods 534 (S). Catahoula Par.: A. R. Moldenke 732 (S). Concordia Par.: A. R. Moldenke 736 (S). DeSoto Par.: A. R. Moldenke 694 (S). Evangeline Par.: A. R. Moldenke 714 (S). Franklin Par.: Moldenke & Woods 529 (S). Grant Par.: A. R. Moldenke 730 (S). Jackson Par.: Moldenke & Woods 533 (S). LaSalle Par.: A. R. Moldenke 729 (S). Lincoln Par.: Moldenke & Woods 537 (S). Natchitoches Par.: A. R. Moldenke 700 (S). Pointe Coupee Par.: A. R. Moldenke 715 (S). Rapides Par.: A. R. Moldenke 731 (S). Red River Par.: A. R. Moldenke 688 (S). Sabine Par.: A. R. Moldenke 701 (S). Saint Landry Par.: A. R. Moldenke 717 (S). Tensas Par.: Moldenke & Woods 528 (S). Vernon Par.: A. R. Moldenke 703 (S). Webster Par.: A. R. Moldenke 682 (S); Moldenke & Woods 548 (S). TEXAS: Camp Co.: Moldenke & Woods 562 (S). Chambers Co.: Gould & Reeves 8227 (Au—194206). CALIFORNIA: Sutter Co.: Balls 11992 (S). BRAZIL: Paraná: Dusén 114320 (N). São Paulo: Brade 5737

[Herb. Inst. Bot. São Paulo 6729] (N); Campos Novaes s.n. [Herb. Inst. Bot. São Paulo 1977] (N); Campos Porto 36 [Herb. Inst. Bot. São Paulo 15730] (N); Edwall s.n. [Pirituba; Herb. Com. Geogr. & Geol. 654; Herb. Inst. Bot. São Paulo 15728] (N). ARGENTINA: Córdoba: Lorentz 131 [Macbride photos 20316] (N—photo).

VERBENA CALLIANTHA Briq.

Additional bibliography: Moldenke, *Phytologia* 8: 417—420 (1962) and 8: 465. 1963; Moldenke, *Résumé Suppl.* 6: 7. 1963.

Briquet (1904) comments as follows about Chodat's original misidentification of this plant as *V. erinoides* Lam.: "Le *V. laciniata* Briq. (= *Erinus laciniatus* L. Sp. Pl. ed. 1, p. 879, ann. 1753 = *V. erinoides* Lamck. Ill. I, 57, ann. 1791) est une plante originaire du Pérou et au Chili à caractères très différents. Voy. à ce sujet: Briquet Lab. Balans. Parag. p. 9."

Additional citations: ARGENTINA: Tucumán: Venturi 3568 (Du—372488).

VERBENA CAMERONENSIS L. I. Davis

Additional bibliography: Moldenke, *Phytologia* 8: 421—425 (1962) and 8: 465. 1963; Moldenke, *Résumé Suppl.* 6: 3 & 4. 1963.

Rinehart found this species on south-facing gravel slopes in Coahuila, fruiting in March, but misidentified it as *V. pumila* Rydb. King found it growing along gravel roads in San Luis Potosí, fruiting in February.

The L. I. Davis s.n. [Southmost, Spring '41] isotype cited by me in *Phytologia* 8: 425 (1962) as deposited at Southern Methodist University is now in the Lundell Herbarium instead, and one of the Lundell & Lundell 8698 specimens cited as in the University of Michigan Herbarium is now also in the Lundell Herbarium instead.

Additional citations: MEXICO: Coahuila: Rinehart 298 (S). San Luis Potosí: R. M. King 3983 (Au—189609), 4249 (Au—189794). Vera Cruz: Galeotti 777, in part [Macbride photos 24699] (N—photo).

VERBENA CANADENSIS (L.) Britton

Additional & emended synonymy: *Verbena montana* Hort. ex Sieb. & Voss in Vilmorin, *Blumeng.*, ed. 3, 1: 825, in syn. 1895 [not *V. montana* Lillo, 1963]. *Verbena canadensis compacta grandiflora* Hurst ex Mattoon, *Pl. Buyers Guide*, ed. 6, 287. 1958. *Verbena canadensis compacta* Hort. ex Mattoon, *Pl. Buyers Guide*, ed. 6, 287. 1958. *Verbena canadensis rosea* Hort. ex Mattoon, *Pl. Buyers Guide*, ed. 6, 287. 1958.

Additional bibliography: Meisn., *Pl. Vasc. Gen.* 2: 198. 1839; Mattoon, *Pl. Buyers Guide*, ed. 6, 287. 1958; Moldenke, *Phytologia* 8: 426—453 (1962) and 8: 465—468, fig. 7. 1963; Moldenke, *Résumé Suppl.* 6: 3, 10, & 11. 1963; Gleason & Cronquist, *Man. Vasc. Pl.* 579 & 581. 1963.

Hardin describes the flowers of this species as blue-lavender. Pond found it in "annual-perennial association" along roadsides in sandy loam area recently burned in Texas.

Seeds of this species are available to the horticultural trade from Hav'a'look Gardens, Ridenour, Hillcrest Nursery, Thompson & Morgan (England), American Perennial Gardens (Garden City, Mich.), Mayfair Nurseries (Nichols, N. Y.), J. Herbert Alexander (Middleboro, Mass.), and Walter J. Guille (Syosset, N. Y.); the "compacta" form from Pearce (Moorestown, N. J.), Saier (Dimondale, Mich.), John Swain (Bristol), and Norsk Fro (Oslo); the "compacta grandiflora" form from Hurst & Son (London); and the "rosea" form from Ridenous, Joseph F. Martin, and Tucker & Son (Belleville).

The Leavitt s.n. [Cambridge, 13 Oct. 1898] distributed as V. canadensis is actually V. elegans H.B.K., while Ammons, Strausbaugh, & Bartholomew s.n. [Presque Isle, July 29, 1940] is V. stricta Vent.

Additional citations: FLORIDA: Leon Co.: R. K. Godfrey 54432 (S). MISSOURI: Jackson Co.: K. K. Mackenzie 62 (Mi). TEXAS: Madison Co.: F. W. Pond 27 (Au—194789). Robertson Co.: Hardin 547 (Au—191113). LOCALITY OF COLLECTION UNDETERMINED: Collector undesignated s.n. (Lu).

VERBENA CANESCENS H.B.K.

Additional bibliography: Moldenke, *Phytologia* 8: 469--475. 1963.

This species has been found in sandy clay soil on flats and on south-facing limestone-gravel slopes in Mexico. The C. T. Mohr s.n. [Hunter's Wharf, Sept. 5, 1892] distributed as V. canescens is actually V. supina L.

Additional citations: TEXAS: Jeff Davis Co.: A. R. Moldenke 645 (S). MEXICO: Aguas Calientes: Hartweg 177 (Lu). Coahuila: Rinehart 221 (S), 294 (S).

VERBENA CANESCENS var. ROEMERIANA (Scheele) Perry

Additional bibliography: Moldenke, *Phytologia* 8: 475--482. 1963; Moldenke, *Résumé Suppl.* 6: 4. 1963.

The H. J. Hamby 1637 distributed as this variety is actually V. cloverae Moldenke.

Additional citations: TEXAS: Bosque Co.: A. R. Moldenke 664 (S). Coryell Co.: Moldenke & Woods 587 (S). Menard Co.: A. R. Moldenke 657 (S). Schleicher Co.: A. R. Moldenke 655 (S).

VERBENA CAROLINA L.

Additional bibliography: Perry, *Ann. Mo. Bot. Gard.* 20: 356. 1933; Moldenke, *Phytologia* 8: 483--495. 1963; Moldenke, *Résumé Suppl.* 6: 11. 1963.

The O. M. Clarke 7348 (N) cited in *Phytologia* 8: 494 (1963) is actually V. recta H.B.K. The H. J. Hamby 747 distributed as

V. carolina is actually V. halei Small, 343 is V. neomexicana var. hirtella Perry, and 545 is V. plicata Greene, while A. A. Eaton 496 is V. scabra Vahl.

Additional citations: ARIZONA: Cochise Co.: A. R. Moldenke 781 (S). MEXICO: Chiapas: Matuda 5295 (Ld). Guerrero: Hinton 9287 (Rf). Hidalgo: Lundell & Lundell 12391 (Rf). México: C. L. Lundell 12209 (Rf); Lundell & Lundell 12355 (Rf). Michoacán: Hinton 13022 (Rf). State undetermined: Collector undesigned s.n. [Chico Chontal] (N).

VERBENA CAROLINA f. ALBIFLORA Moldenke

Additional bibliography: Moldenke, *Phytologia* 8: 495—496. 1963; Moldenke, *Résumé Suppl.* 6: 4. 1963.

VERBENA CHEITMANIANA Moldenke

Additional bibliography: Moldenke, *Phytologia* 9: 9—11. 1963. Material of this species has been misidentified and distributed under the name V. santiagensis Brücher. It has been collected in anthesis in January.

Additional citations: ARGENTINA: Catamarca: Brücher & Brücher s.n. [30/1/49] (Lu).

VERBENA CHILENSIS Moldenke

Additional bibliography: Moldenke, *Phytologia* 9: 11—12. 1963. The correct bibliographic citation for this name is "Moldenke, *Known Geogr. Distrib. Verbenac.*, [ed. 1], 78. 1942".

Additional citations: ARGENTINA: Mendoza: H. H. Bartlett 19410 (Mi).

VERBENA CILIATA Benth.

Additional synonymy: Verbena ciliata Smith, in herb.

Additional bibliography: Moldenke, *Phytologia* 9: 12—22. 1963; Moldenke, *Résumé Suppl.* 6: 3, 4, & 10. 1963.

R. M. King found this plant in "open fields, abundant in open sun, sandy loam" in Puebla, while Rinehart found it "in flat sandy-clay soil" in Coahuila. Iltis, Koeppen, & Iltis encountered it in dry, rocky, level, heavily grazed, Acacia-Hilaria-Opuntia grassland savanna with many herbs like Calochortus, Ruellia, Oxalis, Artemisia, Salvia, Mimulus, etc., while R. F. Smith collected it "in pines" and "in alluvium fields".

Rinehart 217 has remarkably large flowers. E. J. Alexander 2287 represents very well the coarse-leaved form of the species, while his 2288 is typical of the fine-leaved form. More work is needed to determine if more than one taxa are here represented.

Specimens of V. ciliata have been misidentified and distributed in herbaria as V. pumila Rydb.

The H. C. Hanson 304, distributed as V. ciliata, is actually var. longidentata Perry, while Hayes 610 is V. pumila Rydb.

Additional citations: TEXAS: Cameron Co.: Fleetwood 3711 (Au-

192387). Reeves Co.: A. R. Moldenke 644 (S). NEW MEXICO: Sierra Co.: A. R. Moldenke 632 (S). ARIZONA: Coconino Co.: Demaree 46154 (S), 46155 (S), 46191 (S). MEXICO: Chiapas: Matuda 5863 (Ld). Coahuila: Rinehart 217 (S). Guanajuato: Hartweg 176 (Lu-isotype). Hidalgo: Alexander & Hernandez Xolocotzi 276 [E. J. Alexander 2287] (N), 277 [E. J. Alexander 2288] (N). México: Hinton 869 (N, N), 2893 (K, N, Rf, W--1822199), 7466 (K, N, N, N); Leeds s.n. [near Amecameca, March 14, 1929] (Ld); C. L. Lundell 12210 (Rf). Michoacán: Iltis, Koeppen, & Iltis 540a (Ws); R. F. Smith M.97 (Au--218258). Nuevo León: R. F. Smith M.464 (Au--218066). Oaxaca: W. H. Camp 2581 (Mi, N); Conzatti & Camp 5237 (N). Puebla: R. M. King 2627 (Mi). Vera Cruz: C. L. Lundell 12535 (Rf).

VERBENA CILIATA var. LONGIDENTATA Perry

Additional bibliography: Moldenke, *Phytologia* 9: 22--26. 1963; Moldenke, *Résumé Suppl.* 6: 3 & 4. 1963.

Hanson describes this plant as "frequent in fields" and "abundant on prairies" in Cameron County, Texas.

Additional citations: TEXAS: Cameron Co.: Fleetwood 3444 (Au--192006); H. C. Hanson 304 (N), 322, in part (N).

VERBENA CILIATA var. PUBERA (Greene) Perry

Additional bibliography: Moldenke, *Phytologia* 9: 26--27. 1963; Moldenke, *Résumé Suppl.* 6: 3 & 10. 1963.

Additional citations: TEXAS: Lubbock Co.: Demaree 7460 (Au--198085).

VERBENA CLAVATA Ruiz & Pav.

Additional bibliography: Acevedo de Vargas, *Bol. Mus. Nac. Hist. Nat. Chile* 25: 70. 1951; Moldenke, *Phytologia* 9: 29--32. 1963; Moldenke, *Résumé Suppl.* 6: 6. 1963.

The specimen represented by Macbride's photograph 17408 was deposited in the Berlin herbarium before World War II and is now destroyed.

Additional citations: PERU: Huánuco: Ruiz s.n. [Macbride photos 17408] (N--photo of cotype).

VERBENA CLAVATA var. CASMENSIS Moldenke

Additional bibliography: Moldenke, *Phytologia* 9: 32--33. 1963; Moldenke, *Résumé Suppl.* 6: 6. 1963.

VERBENA CLOVERAE Moldenke

Additional synonymy: Verbena clovei Smith, in herb.

Additional bibliography: Moldenke, *Phytologia* 9: 34--37. 1963; Moldenke, *Résumé Suppl.* 6: 3 & 10. 1963.

Smith refers to this plant as a "low herb".

Additional citations: MEXICO: Nuevo León: R. F. Smith M.62 (Au--218096).

VERBENA CLOVERAE f. ALBA Lundell, *Wrightia* 2: 47 [as "cloveri"].
1960.

Bibliography: C. L. Lundell, *Wrightia* 2: 47. 1960; Moldenke, *Résumé Suppl.* 6: 3. 1963.

This form differs from the typical form of the species in having white corollas.

The type of the form was collected by Cyrus Longworth Lundell and Amelia A. Lundell (no. 15055) in open brush off U. S. Highway 83, 8 miles south of Zapata, Zapata County, Texas, on March 31, 1958, and is deposited in the herbarium of the Texas Research Foundation at Renner, Texas. The form is known thus far only from the type specimen.

Citations: TEXAS: Zapata Co.: Lundell & Lundell 15055 (Rf-type).

VERBENA COCCINEA Raf., *Herb. Raf.* 50, nom. nud. 1833.

Bibliography: Raf., *Herb. Raf.* 50. 1833; E. D. Merr., *Ind. Raf.* 205 & 295. 1949.

I know nothing about this plant except that Merrill (1949) lists it as having been named and published by Rafinesque, with the type specimen from "Oregon or the Rocky Mountains".

VERBENA COCHABAMBENSIS Moldenke

Additional synonymy: Verbena myriofila Maria, *Pl. Vall. Cochab.* 38, hyponym. 1962. Verbena myriophylla Maria, in herb.

Additional bibliography: Maria, *Pl. Vall. Cochab.* 38. 1962.

Maria (1962) says for his V. myriofila "Hierba ramificada desde la base, florece en cimas de color lila brillante: es un verdadero adorno que alegra el campo" and cites Hermano Adolfo Maria 180/4c from Tarani, Cochabamba, Bolivia, collected on December 16, 1954. I have examined a specimen of his no. 180 and found it to be typical V. cochabambensis.

Additional citations: BOLIVIA: Cochabamba: A. Maria 180 (Z).

VERBENA CONCEPCIONIS Moldenke

Additional bibliography: Acevedo de Vargas, *Bol. Mus. Nac. Hist. Nat. Chile* 25: 70. 1951; Moldenke, *Phytologia* 9: 39--40. 1963.

VERBENA CORYMBOSA Ruiz & Pav.

Additional bibliography: Mattoon, *Pl. Buyers Guide*, ed. 6, 287. 1958; Moldenke, *Phytologia* 9: 40--45. 1963.

Mattoon (1958) states that seeds of this species are offered to the horticultural trade by Thompson & Morgan (England), Hillier & Sons (Winchester), and John Forbes (Hawick).

XVERBENA COVASII Moldenke

Additional bibliography: Schnack & Covas, *Revist. Argent. Agronom.* 12: 224. 1945.

VERBENA CRITHMIFOLIA Gill. & Hook.

Additional bibliography: Moldenke, *Phytologia* 9: 46--49. 1963; Moldenke, *Résumé Suppl.* 6: 9 & 10. 1963.

The Brücher & Brücher s.n. [28/12/48] distributed as V. crithmifolia is actually V. hookeriana (Covas & Schnack) Moldenke.

Additional citations: ARGENTINA: La Pampa: Burkart s.n. [Herb. Inst. Bot. Darwinion 20575] (W--2340690). Río Negro: W. Fischer 90 (N).

VERBENA CUMINGII Moldenke

Additional bibliography: Acevedo de Vargas, *Bol. Mus. Nac. Hist. Nat. Chile* 25: 70. 1951; Moldenke, *Phytologia* 9: 49--50. 1963; Moldenke, *Résumé Suppl.* 6: 10. 1963.

VERBENA CUNEIFOLIA Ruiz & Pav.

Additional bibliography: Acevedo de Vargas, *Bol. Mus. Nac. Hist. Nat. Chile* 25: 70. 1951; Moldenke, *Phytologia* 9: 50--52. 1963.

Additional citations: PERU: La Libertad: López Miranda & Sagástegui 3543 (S).

xVERBENA DEAMII Moldenke

Additional bibliography: Gleason & Cronquist, *Man, Vasc. Pl.* 581. 1963; Moldenke, *Phytologia* 9: 53--54 & 59. 1963.

VERBENA DELTICOLA Small

Additional bibliography: Moldenke, *Phytologia* 9: 60--64. 1963; Moldenke, *Résumé Suppl.* 6: 4. 1963.

The Herb. Mexican Bound. Surv. s.n. [Plains near Leon Springs, September 7, 1852] was originally distributed as V. pumila Rydb. or perhaps was a mixture with that species. Fleetwood 6079 bears a notation by the collector "other plants had more dissected leaves". Herbarium material of V. delticola has also been distributed as V. racemosa Eggert.

Additional citations: TEXAS: Bexar Co.: Herb. Mexican Bound. Surv. s.n. [Plains near Leon Springs, September 7, 1852] (N). Hidalgo Co.: Fleetwood 6079 (Au--217043). MEXICO: Nuevo León: Pringle 11843 (Au--183886); R. F. Smith M.10 (Au--218058).

VERBENA DEMISSA Moldenke

Additional bibliography: Hocking, *Dict. Terms Pharmacog.* 284. 1935; Moldenke, *Phytologia* 9: 65--66. 1963.

VERBENA DISSECTA Willd.

Additional & emended bibliography: Morong, Britton, & Vail, *Ann. N. Y. Acad. Sci.* 7: 197. 1893; Schnack & Covas, *Revist. Argent. Agronom.* 12: 224. 1945; Acevedo de Vargas, *Bol. Mus. Nac. Hist. Nat. Chile* 25: 70. 1951; Moldenke, *Phytologia* 9: 67--75. 1963; Moldenke, *Résumé Suppl.* 6: 7 & 8. 1963.

The C. Camargo 62124; Gallinal, Aragone, Bergalli, Campal, & Rosengurt PE.5048; Legrand 2664 & 2717; and E. Wall s.n. [15/10/

1946], distributed as V. dissecta, are actually V. tenera Spreng.
Additional citations: ARGENTINA: Tucumán: R. Rocha 3818 (Lu).

VERBENA DOMINGENSIS Urb.

Additional bibliography: Moldenke, *Phytologia* 9: 76—79. 1963;
Moldenke, *Résumé Suppl.* 6: 8 & 10. 1963.

VERBENA DUSENII Moldenke

Additional bibliography: Moldenke, *Phytologia* 9: 79—80. 1963.
Additional citations: BRAZIL: Paraná: Dusén 7108 (Lu--isotype).

VERBENA ELEGANS H.B.K.

Additional bibliography: Moldenke, *Phytologia* 9: 82—86. 1963;
Moldenke, *Résumé Suppl.* 6: 8. 1963.

The R. M. King 4513 cited in *Phytologia* 9: 85 (1963) as V. elegans appears to me better regarded as var. asperata Perry.

Additional citations: MEXICO: Coahuila: E. G. Marsh 1225 (Au—213647), 1258 (Au—213044).

VERBENA ELEGANS var. ASPERATA Perry

Additional bibliography: Moldenke, *Phytologia* 9: 86—89. 1963;
Moldenke, *Résumé Suppl.* 6: 8. 1963.

Soderstrom states that the corollas of this plant are pink, "turning blue with age", and that the plant is "frequent on rocky clay sides of arroyo". King 4513, previously regarded by me as typical V. elegans H.B.K., is said by the collector to have had dark-lavender flowers and to have been abundant in gravelly soil, open sun.

Additional citations: MEXICO: Chihuahua: Soderstrom 847 (Mi).
Tamaulipas: R. M. King 4513 (Au—189940, N). LOCALITY OF COLLECTION UNDETERMINED: Gizantoro s.n. [9.66] (Lu).

xVERBENA ENGEIMANNII Moldenke

Additional synonymy: Verbena hastata var. β oblongifolia Nutt., *Gen.* 2: 40. 1818. Verbena hastata γ oblongifolia Nutt. ex Wood, *Class-Book*, ed. 41, 412. 1856. Verbena hastata var. oblongifolia Nutt. apud Small & Heller, *Mem. Torrey Bot. Club* 3: 12, in syn. 1892.

Additional bibliography: Nutt., *Gen.* 2: 40. 1818; Wood, *Class-Book*, ed. 41, 412. 1856; Small & Heller, *Mem. Torrey Bot. Club* 3: 12. 1892; Perry, *Ann. Mo. Bot. Gard.* 20: 267. 1933; Moldenke, *Phytologia* 9: 89—96. 1963; Moldenke, *Résumé Suppl.* 6: 1. 1963; Gleason & Cronquist, *Man. Vasc. Pl.* 580. 1963; B.A.S.I.C. 43 (2): B.112. 1963.

Small & Heller (1892) and Perry (1933) place Nuttall's name doubtfully in synonymy under V. riparia Raf. However, Nuttall based his name on two collections from along the Delaware River near Philadelphia, Pennsylvania, and himself suggests that it represents a hybrid between V. hastata L. and V. urticifolia L. His description of the plant is: "V. hastata. Flowers deep blue;

rarely if ever hastate. Of this species there appears to be a very distinct variety near Philadelphia which I shall distinguish by the name of β . *oblongifolia, having oblong-lanceolate deeply serrated leaves, merely acute, and not acuminate; spikes filiform, paniculate; flowers smaller, pale blue. May this be V. paniculata of Lamarck? but the flowers are not imbricated, nor in the least corymbose, it appears to be equally remote from V. diffusa of the same, but assuredly intermediate, if not a hybrid betwixt V. hastata and V. urticifolia. It has only occurred to me twice on the banks of the Delaware." It seems obvious to me that this cannot apply to the V. riparia Raf. as published by and typified by Small and Heller and known definitely only from Virginia and North Carolina -- although it MAY be the same as Rafinesque's original plant which came from "Long Island, New Jersey, and the Chesapeak".

Additional citations: MISSOURI: Saint Louis: Engelmann s.n. [St. Louis, Aug. 1843] (Au--122804).

VERBENA FILICAULIS Schau.

Additional & emended bibliography: Hook. f. & Jacks., Ind. Kew. 2: 1178 & 1179. 1895; Moldenke, Phytologia 9: 119--121. 1963.

Additional citations: BRAZIL: Minas Gerais: Widgren s.n. [1845] (Lu). Paraná: Jönsson 1392a (Lu).

VERBENA GOODDINGII Briq.

Additional bibliography: Moldenke, Phytologia 9: 131--141, fig. 8. 1963.

Langenheim reports finding this plant in rocky soil on top of a ridge.

Additional citations: NEVADA: Clark Co.: Langenheim 3728 (Au--209322). NEW MEXICO: Luna Co.: A. R. Moldenke 631 (S). ARIZONA: Gila Co.: A. R. Moldenke 624 (S), 626 (S). Pima Co.: A. R. Moldenke 625 (S). Santa Cruz Co.: A. R. Moldenke 621 (S). CULTIVATED: California: Balls 19756 (Au--122111).

VERBENA GOODDINGII var. NEPETIFOLIA Tidestr.

Additional bibliography: Moldenke, Phytologia 9: 141--146. 1963.

Additional citations: MEXICO: Sonora: I. L. Wiggins 11775 (Au--182224).

VERBENA GRACILESCENS (Cham.) Herter

Emended synonymy: Verbena gracilescens Cham. ex Hicken, Chlor. Plat. Argent. 197. 1910.

Additional bibliography: Moldenke, Phytologia 9: 148--154. 1963.

Additional citations: BOLIVIA: Cochabamba: A. Maria 178 (Z).

VERBENA GRACILIS Desf.

Additional bibliography: Moldenke, Phytologia 9: 154--158. 1963.

Additional citations: ARIZONA: Cochise Co.: A. R. Moldenke 617 (S). MEXICO: Aguas Calientes: Hartweg 174 (Lu). Federal District: Berlandier 578 (Lu).

VERBENA HALEI Small

Additional bibliography: Moldenke, Phytologia 9: 160--175, fig. 9. 1963.

Gould & Hycka encountered this plant in open oak-mesquite woods in Texas.

Additional citations: ALABAMA: Cullman Co.: Moldenke & Woods 504 (S). MISSISSIPPI: Jefferson Co.: A. R. Moldenke 738 (S). Warren Co.: Moldenke & Woods 525 (S, Z, Z). Yazoo Co.: Moldenke & Woods 524 (S). LOUISIANA: Avoyelles Par.: A. R. Moldenke 722 (S). Bienville Par.: A. R. Moldenke 687 (S); Moldenke & Woods 541 (S). Bossier Par.: A. R. Moldenke 679 (S); Moldenke & Woods 549 (S). Caddo Par.: Moldenke & Woods 551 (S). Caldwell Par.: Moldenke & Woods 535 (S). Claiborne Par.: Moldenke & Woods 543 (S). DeSoto Par.: A. R. Moldenke 693 (S). Franklin Par.: Moldenke & Woods 530 (S), 564 (S). Jackson Par.: Moldenke & Woods 532 (S). Lincoln Par.: Moldenke & Woods 538 (S). Natchitoches Par.: A. R. Moldenke 697 (S). Pointe Coupee Par.: A. R. Moldenke 720 (S). Red River Par.: A. R. Moldenke 690 (S). Tensas Par.: Moldenke & Woods 527 (S). Webster Par.: A. R. Moldenke 681 (S); Moldenke & Woods 547 (S). TEXAS: Anderson Co.: Hardin 531 (Au--191114). Bell Co.: Moldenke & Woods 586 (S). Camp Co.: Moldenke & Woods 560 (S). Cameron Co.: Fleetwood 3508a (Au--192305). Cass Co.: Moldenke & Woods 558 (S). Comanche Co.: A. R. Moldenke 658 (S); Moldenke & Woods 595 (S). Harrison Co.: A. R. Moldenke 675 (S). Hill Co.: Moldenke & Woods 567 (S). Hopkins Co.: Moldenke & Woods 565 (S). Lynn Co.: Moldenke & Woods 598 (S). Marion Co.: Moldenke & Woods 553 (S). Morris Co.: Moldenke & Woods 557 (S). San Patricio Co.: Gould & Hycka 7990 (Au--194466). Upshur Co.: A. R. Moldenke 673 (S). Van Zandt Co.: A. R. Moldenke 672 (S). Wood Co.: A. R. Moldenke 670 (S); Moldenke & Woods 563 (S).

VERBENA HASTATA L.

Additional synonymy: Verbena hastata var. paniculata (Lam.) Farwell, Ann. Rep. Comm. Parks & Boul. Detroit 11: 82. 1900. Verbena paniculata var. pinnatifida Schau. ex Perry, Ann. Mo. Bot. Gard. 20: 278, in syn. 1933. Verbena hastata γ Poir. apud Perry, Ann. Mo. Bot. Gard. 20: 278, in syn. 1933. Verbena hastata var. paniculata Farwell ex Moldenke, Prelim. Alph. List Invalid Names 46, in syn. 1940. Verbena hastata var. pinnatifida Gray ex Moldenke, Prelim. Alph. List Invalid Names 46, in syn. 1940. Verbena hastata Michx. ex Moldenke, Suppl. List Invalid Names 8, in

syn. 1941. Verbena hastata var. pinnatifida (Lam.) Britton ex Moldenke, Suppl. List Invalid Names 8, in syn. 1941. Verbena lacunosa Schrad. ex Moldenke, Alph. List Invalid Names Suppl. 1: 25, in syn. 1947 [not V. lacunosa Mart., 1941]. Verbena lanceolata Bolde ex Moldenke, Alph. List Invalid Names Suppl. 1: 25, in syn. 1947 [not V. lanceolata Willd., 1825]. Verbena paniculata Schau. ex Moldenke, Alph. List Invalid Names Suppl. 1: 26, in syn. 1947. Verbena hastata L. apud Deam, Yuncker, & Friesner, Proc. Ind. Acad. Sci. 58: 95, sphalm. 1948. Verbena hastata x simplex Gates, in part, ex Moldenke, Résumé 365, in syn. 1959. Verbena hastata x stricta Elmore ex Moldenke, Am. Midl. Nat. 59: 359, in syn. 1958 [not V. hastata x stricta Allen, 1958, nor Anderson, 1958, nor Ravenel, 1959, nor Rydb., 1894]. Verbena hastata var. lanceolata House ex Moldenke, Résumé 366, in syn. 1959. Verbena hastata var. pinnatifida Britton ex Moldenke, Résumé 366, in syn. 1959. Verbena astrata L., in herb. Verbena hastata var. pinnatifidum (Lam.) Sch. ex Moldenke, Résumé Suppl. 3: 38, in syn. 1962. Liatris pinnata Nash ex Moldenke, Résumé Suppl. 3: 33, in syn. 1962. Verbesina biserrata Nash ex Moldenke, Résumé Suppl. 3: 42, in syn. 1962. Verbena hastata L. ex Moldenke, Résumé Suppl. 3: 38, in syn. 1962.

Bibliography: P. Herm., Hort. Acad. Lugd.-Bat. Cat. 699. 1687; P. Herm., Fl. Lugd.-Bat. 54--55. 1690; P. Herm., Parad. Bot., ed. 1, 242. 1698; Ray, Hist. Plant. Suppl. 3: App. 286. 1704; P. Herm., Parad. Bot., ed. 2, 242, pl. 242. 1705; Boerh., Ind. Alt. Plant. Hort. Acad. Lugd.-Bat., ed. 2, 1: 186 (1720) & ed. 3, 1: 186. 1727; L., Hort. Cliff. 11. 1737; A. van Royen, Fl. Leyd. Prod. 327. 1740; L., Hort. Upsal. 8. 1748; Haartm., Pl. Hybr. 8. 1751; L., Sp. Pl., ed. 1, 20. 1753; Haartm. in L., Amoen. Acad. 3: 43. 1756; L., Syst. Nat., ed. 10, 852. 1759; Printz in L., Amoen. Acad. 6: 81. 1760; J. F. Gronov., Fl. Virg., ed. 2, 4. 1762; N. L. Burm., Fl. Cap. Prodr. 1. 1768; J. A. Murray in L., Syst. Veg., ed. 13, 62. 1774; Sabbat in Martelli, Hort. Roman. 3: 10--11, pl. 54. 1775; Christm. & Panzer, Vollst. Pflanzensyst. Houttuyn 5: 126--127. 1779; Lam., Tabl. Encycl. Méth. Bot. 1: 57. 1791; Willd., Sp. Pl. 1: 118. 1797; C. Murr., Brit. Gard. 2: 479. 1799; Poir. in Lam. Encycl. Méth. Bot. 8: 546--548. 1808; J. Sm. in Rees, Cycl. 36: nos. 10 & 19. 1817; Steud., Nom. Bot., ed. 1, 873. 1821; Spreng. in L., Syst. Veg., ed. 16, 2: 748 & 749. 1825; Lindl., Bot. Reg. 13: pl. 1102. 1827; Sweet, Hort. Brit., ed. 2, 418. 1830; Van Hall, Epist. Ined. Carol. Linn. 95. 1830; H. E. Richter, Cod. Bot. Linn. 35. 1835; Peterm., Cod. Bot. Linn. Ind. Alph. 196. 1840; Eaton & Wright, N. Am. Bot., ed. 8, 470. 1840; Torr., Fl. State N. Y. 2: 51--52 & 570. 1843; Engelm., Am. Journ. Sci. 46: 99. 1844; Walp., Repert. Bot. Syst. 4: 20--21. 1845; Schau. in A. DC., Prodr. 11: 545--546. 1847; Wood, Class-Book, ed. 41, 412. 1856; A. W. Chappm., Fl. South. U. S., ed. 1, pr. 1, 307 (1860), pr. 2, 307 (1865), and pr. 3, 307. 1872; Am. Agr. 1874: 64. 1874; A. Gray, Syn. Fl. N. Am. 2 (1): 336. 1878; Pickering,

- Chronolog. Hist. Pl. 949, 968, & 1220. 1879; W. Mill., Dict. Eng. Names Pl. 141 & 261. 1884; A. W. Chapm., Fl. South. U. S., ed. 2, pr. 1, 307 (1884) and pr. 2, 307. 1887; Rattan, Popular Calif. Fls., rev. ed. 8, 11. 1888; A. W. Chapm., Fl. South. U. S., ed. 2, pr. 3, 307. 1889; A. S. Hitchc., Trans. St. Louis Acad. Sci. 5: 512. 1891; Coult., Contrib. U. S. Nat. Herb. 2: 327. 1892; A. W. Chapm., Fl. South. U. S., ed. 2, pr. 4, 307. 1892; Dana, How to Know Wild Fls., ed. 1, 252, 291, & 297 (1893) and ed. 7, 252, 291, & 297, pl. 92. 1894; Briq. in Engl. & Prantl, Nat. Pflanzenfam. 4 (3a): 148. 1894; Britton, Mem. Torrey Bot. Club 5: 276. 1894; Wild Fls. Canada pl. 9. 1894; Hook. f. & Jacks., Ind. Kew. 2: 1179. 1895; Dana, How to Know Wild Fls., rev. ed., 314, 365, & 371. 1895; Mill. & Whiting, Wild Fls. Northeast. States 486. 1895; L. H. Bailey in A. Gray, Field Forest & Gard. Bot. 341. 1895; Rydb., Contrib. U. S. Nat. Herb. 3: 173 (1895) and 3: 518. 1896; A. W. Chapm., Fl. South. U. S., ed. 3, 368. 1897; Britton & Br., Illustr. Fl., ed. 1, 3: 69 & 70, 554, 571 & 586, fig. 3059. 1898; A. S. Hitchc., Fl. Kans. pl. 14. 1899; Blanchan, Nat. Gard. 40. 1900; Farwell, Ann. Rep. Comm. Parks & Boul. Detroit 11: 82. 1900; Mohr, Contrib. U. S. Nat. Herb. 6: 693. 1901; H. H. W. Pearson in Thiselt.-Dyer, Fl. Cap. 5: 207. 1901; Chesnut, Contrib. U. S. Nat. Herb. 7: 383. 1902; Small, Fl. South. U. S., ed. 1, 1009. 1903; L. H. Pammel, Bull. Iowa Agric. Sta. 70: 513. 1903; Selby & Hicks, Bull. Ohio Agric. Sta. 142: pl. 4. 1903; Michx., Trav. West Alleg., ed. Thwaite, 67. 1904; Selby & Hicks, Bull. Ohio Agric. Sta. 175: pl. 4. 1906; U. S. Dept. Agr. Farm. Bull. 260: 22. 1906; Clark & Fletcher, Farm Weeds Canada, ed. 1, pl. 54, fig. 31. 1906; Piper, Contrib. U. S. Nat. Herb. 11: 519. 1906; MacDougal, Bot. Gaz. 43: 57. 1907; Chadwick, Bull. N. Y. State Mus. 124: 150. 1908; Robinson & Fern. in A. Gray, New Man. Bot., ed. 7, 689 & 924. 1908; M. A. Day, Check List 128. 1908; Clark & Fletcher, Farm Weeds Canada, ed. 2, pl. 75, fig. 61. 1909; Beal, Mich. Weeds [Bull. Mich. Agric. Exp. Sta. 267:] 396. 1911; Daniels, Fl. Boulder Colo. 204. 1911; Beal, Ann. Rep. Mich. Agric. Sta. 25: 385. 1912; Creevey, Harper's Guide Wild Fls. 332. 1912; L. H. Pammel, Iowa Geol. Surv. Bull. 4: 263 & 468. 1913; Britton & Br., Illustr. Fl., ed. 2, 3: 94, 95, 599, 618, & 635, fig. 3554. 1913; Small, Fl. Southeast. U. S., ed. 2, 1009. 1913; Bendrat, Torreya 13: 61. 1913; Stetson, Torreya 13: 131. 1913; Canada Dept. Agr. [Seed Br.] Bull. S-8: 51. 1914; A. Georgia, Man. Weeds pl. 238. 1914; Dana, How to Know Wild Fls., new ed., 291, 338, & 345. 1915; Woot. & Standl., Contrib. U. S. Nat. Herb. 19: 549. 1915; E. Brainerd, Vt. Agr. Exp. Sta. Bull. 187: 238. 1915; Palmer, Proc. Iowa Acad. Sci. 23: pl. 9. 1916; E. J. Palmer, Ann. Mo. Bot. Gard. 3: 392. 1916; H. A. Gleason, Torreya 16: 2. 1916; C. A. Reed, Fl. Guide 152 & 231. 1916; Blanchan, Wild Fls. [New Nat. Lib. 6:] 40. 1916; Felt, Bull. N. Y. State Mus. 200: 182. 1917; C. L. Pollard in Webster's New Internat. Dict. Eng. Lang. 2275. 1917; Rydb., Fl. Rocky Mts. 739-740. 1917; House, Wild Fls. N. Y. 2: [Mem. N. Y. State Mus. 15:] 234, 336, & 361, pl. 183B. 1918; Lovell, Flower & Bee 255. 1919; Kanda, Bot. Gaz. 69: 54-71, fig. 54-59, 63, 75, & pl. 6, fig. 7. 1920; Pellett, Am. Honey Pl., ed. 1, 266. 1920; Fernald, Rhodora

- 23: 289. 1921; Blanchan, Wild Fls. Worth Knowing 185--186 & 270. 1922; Pellett, Am. Honey Pl., ed. 2, 353, fig. 181. 1923; Goss, Journ. Agr. Res. 29: 349--362. 1924; Olmsted, Coville, & Kelsey, Stand. Pl. Names, ed. 1, 521. 1924; Druce, Rep. Bot. Exch. Club Brit. Isles 1923: 205. 1924; Tidestr., Contrib. U. S. Nat. Herb. 25: 469. 1925; Jepson, Man. Flow. Pl. Calif. 858, fig. 806. 1925; G. Johnson, Nat. Program 84. 1926; E. J. Alexander, Addisonia 13: 11, pl. 422. 1928; Roberts & Rehmann, Am. Pl. for Am. Gard. 87, 96, & 130. 1929; H. F. Roberts, Pl. Hybrid. before Mendel 24. 1929; Stebbins, Rhodora 31: 85. 1929; Seymour, Host Ind. Fungi N. Am. 587. 1929; Moldenke, List Spec. Mold. Southeast. Set 10. 1930; E. J. Palmer, Journ. Arnold Arb. 11: 111. 1930; Stapf, Ind. Lond. 6: 429 & 430. 1931; Gier, Trans. Kans. Acad. Sci. 34: 261. 1931; Wolden, Proc. Iowa Acad. Sci. 39: 122. 1932; Benner, Fl. Bucks Co. 255. 1932; Rydb., Fl. Prairies & Plains 677--678, fig. 479. 1932; Perry, Ann. Mo. Bot. Gard. 20: 247, 260, 267, 278--282, 284, & 355. 1933; J. K. Small, Man. Southeast. Fl. 1136. 1933; Moldenke, Obs. Fl. Watchung, [ed. 1], 7 (1933) and ed. 2, 10. 1933; Junell, Symb. Bot. Upsal. 4: 11, 12, 14, 19, 164, 171, & 210, fig. 21. 1934; J. H. Harris, Physico-chem. Prop. Plant Saps 126. 1934; House, Wild Fls. 234, 336, & 361, pl. 183B. 1934; L. H. Bailey, Cat. Florists Handl. Verbenac. mss. 1935; J. King, Wild Fls. at a Glance 42. 1935; Muenscher, Weeds N. Y. [Cornell Univ. Agr. Exp. Sta. Bull. 635:] 10. 1935; L. H. & E. Z. Bailey, Hortus, new rev. ed., 632. 1935; E. J. Palmer, Ann. Mo. Bot. Gard. 22: 629. 1935; H. T. Darlington, Papers Mich. Acad. Sci. 22: 62. 1936; Dermen, Cytologia 7: 161--163, fig. 12. 1936; Hermann, Papers Mich. Acad. Sci. 22: 88. 1937; Bausor, Torreya 37: 51. 1937; Cory, Texas Agr. Exp. Sta. Bull. 550: 88. 1937; Moldenke, Revist. Sudam. Bot. 4: 18--20. 1937; Svensk. Bot. Tidsk. 32: 231. 1938; Crocker, Bot. Rev. 4: 256. 1938; O. A. Stevens, Wild Fls. N. Dak. 45. 1938; Little, Am. Midl. Nat. 19: 385. 1938; H. B. & J. L. Lovell, Rhodora 41: 184--187. 1939; Moldenke, Annot. & Classif. List 108. 1939; Moldenke, Alph. List Common Names 5, 9, 16, 28, 32, & 33. 1939; Hylander, World Pl. Life 443. 1939; Moldenke, List Obs. Fl. Watchung 41. 1940; Gates, Fl. Kans. 190, map 1069. 1940; Moldenke, Prelim. Alph. List Invalid Names 46 & 47. 1940; Moldenke, Suppl. List Common Names 2, 4, 7, 18, & 23. 1940; C. C. Deam, Fl. Indiana 795--798 & 1232, map 1721. 1940; W. A. Weber, Summer Fl. Northrop Camp mss. 1940; Worsdell, Ind. Lond. Suppl. 2: 486. 1941; Moldenke, Suppl. List Invalid Names 8. 1941; Gates, Weeds Kans. 42, 91, & 219. 1941; C. N. Jones, Ohio Journ. Sci. 41: 340. 1941; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 1--11, 13--15, 44, 74, & 101. 1942; Moldenke, Alph. List Invalid Names 47 & 49. 1942; Deam, Kriebel, Yuncker, & Friesner, Proc. Ind. Acad. Sci. 51: 127. 1942; H. N. Webster, Herbs 64. 1942; Schnack, Anal. Inst. Fitotéc. Sta. Catalina 4: 17--19. 1942; Moldenke in Lundell, Fl. Texas 3 (1): 16 & 24--25. 1942; Pim, Nature Mag. 35: 183. 1942; Potzger, Trans. Wisc. Acad. Sci. 35: 145. 1943; Allard & Leonard, Castanea 8: 47. 1943; Webster's College Dict., ed. 5, 1115. 1943; C. N. Jones, Ohio Journ. Sci. 43: 191. 1943; Jepson, Fl. Calif. 3 (2): 380--381, fig. 419. 1943; C. W. Lowe,

- List Flow. Pl. Man. 81. 1943; E. L. Braun, Annot. Cat. Sperm. Ky. 116. 1943; Moldenke, Fl. N. Appal. Exp. Watershed 28 & 56. 1943; Moldenke, Known Geogr. Distrib. Verbenac. Suppl. 1: 1 & 2. 1943; E. L. D. Seymour, New Gard. Encycl. 1279. 1944; Moldenke, Obs. Fl. Warren 27. 1944; Moldenke, Obs. Fl. Warren Suppl. 1: 11. 1944; Rouleau, Inst. Bot. Univ. Montréal Contrib. 54: 161, 225, & 364. 1944; Schnack & Covas, Darwiniana 6: 470. 1944; Moldenke, Castanea 9: 69 (1944) and 10: 35--39. 1945; Deam, Kriebel, Yuncker, & Friesner, Proc. Ind. Acad. Sci. 54: 95. 1945; Seed Trade Buyers Guide 86. 1945; Darlington & Janaki Ammal, Chromosome Atl. 270. 1945; H. E. Stone, Fl. Chester Co. 1124--1126. 1945; Moldenke, Bot. Gaz. 106: 158--161. 1945; Moldenke, Torreya 45: 50 & 90. 1945; Moldenke, Am. Journ. Bot. 32: 609 & 610. 1945; C. N. Jones, Ohio Journ. Sci. 45: 165. 1945; G. N. Jones, Fl. Ill. [Am. Midl. Nat. Monog. 2:] 216. 1945; Moldenke, Phytologia 2: 68, 82, 84, & 115. 1945; Moldenke, Am. Midl. Nat. 35: 377. 1946; G. L. Fisher, Am. Bot. Exchange List. 1946; Moldenke, Alph. List Cit. 1: 4, 8--10, 13--16, 18--20, 25, 26, 29--33, 35, 37, 38, 40, 41, 46, 47, 50, 51, 54, 59, 72, 74, 80, 81, 88, 89, 94, 98--100, 104, 107, 109--112, 115, 119, 124, 125, 129--131, 139--145, 148--153, 160, 162--165, 174--177, 181--184, 191, 194, 195, 197--199, 201, 202, 204--207, 209, 211--215, 217, 224--226, 234, 235, 239, 242--248, 250, 254--256, 258, 260, 265, 267, 268, 270, 271, 274, 278--285, 287, & 291--297. 1946; Pellett, Am. Honey Pl., ed. 4, 420. 1947; Hotchkiss & Stewart, Am. Midl. Nat. 38: 55. 1947; Tatnall, Fl. Del. 218. 1947; Deam, Yuncker, & Friesner, Proc. Ind. Acad. Sci. 56: 110. 1947; Moldenke, Phytologia 2: 325--327, 329, 348, 382, & 383. 1947; Moldenke, Alph. List Invalid Names Suppl. 1: 24--26. 1947; Moldenke, Wrightia 1: 224. 1948; Moldenke, Castanea 13: 110--113. 1948; Ogden, Steirmetz, & Hyland, Bull. Josselyn Bot. Soc. 8: 55. 1948; Deam, Yuncker, & Friesner, Proc. Ind. Acad. Sci. 57: 84 (1948) and 58: 95. 1948; John W. Harshberger Trail Bowman's Hill State Wildfl. Pres. Washingt. Cross. 2. 1948; Hausman, Begin. Guide Wild Fls. 303 & 375. 1948; Moldenke, Alph. List Cit. 2: 356, 357, 361, 362, 390--402, 404--407, 410, 414, 438, 439, 443, 449, 451--456, 467, 469--473, 475--478, 480, 481, 488, 491--493, 495, 496, 498, 504--507, 511, 513, 515--517, 519--530, 535, 536, 538, 544--548, 554--556, 558--560, 567--569, 571, 572, 574, 576, 579--581, 583--585, 588, 592, 594--598, 604, 606, 609, 612--615, 617, 619--621, 630--634, 640, 644, 645, & 652 (1948), 3: 653, 660, 666--668, 672--674, 684, 686, 698--701, 707, 708, 713, 715, 717--722, 726, 737, 738, 740--744, 747, 750, 753, 755, 756, 759--761, 766, 769, 770, 773--775, 778, 780, 782, 783, 789--793, 797, 799, 800, 802, 803, 805, 807, 808, 811--813, 815, 816, 822, 823, 826--828, 831, 832, 839, 841--843, 851, 852, 854, 858, 866, 869, 870, 881, 884, 887, 892, 898, 904, 906, 915--917, 926, 927, 930--932, 939, 941, 942, 946, 947, 949--955, 963, 970, 971, 973, & 977 (1949), and 4: 979--983, 985, 986, 988--990, 994, 995, 998, 999, 1002--1004, 1010, 1013--1015, 1084, 1085, 1098--1100, 1103, 1109--1112, 1114, 1117--1119, 1121, 1123, 1125, 1128, 1129, 1134--1138, 1142, 1145, 1147--1149, 1151, 1152, 1155, 1162, 1164, 1165, 1169, 1172--1175, 1177, 1178, 1181, 1182, 1184--1189,

- 1191--1193, 1197, 1199--1201, 1203, 1205, 1207, 1209--1214, 1217, 1218, 1220--1222, 1224--1232, 1235--1239, 1241, 1246--1248, 1251--1253, 1256, 1260, 1261, 1288--1292, 1294, & 1297--1299. 1949; E. L. Palmer, *Handb. Nat. Hist.* 297 & 663. 1949; Heusser, *Bull. Torrey Bot. Club* 76: 393. 1949; Loew, *Ann. Rep. Huntington Coll. Bot. Gard.* 13: 37. 1949; H. N. & A. L. Moldenke, *Anal. Inst. Biol. Mex.* 20: 13. 1949; Moldenke, *Am. Wild Fls.* 293 & 450. 1949; Wanted to Buy, *Oregon Biol. Supply Co.* 12. 1949; W. P. Eaton & al., *Bartholomew's Cobble* [p. 8]. 1949; Moldenke, *Known Geogr. Distrib. Verbenac.*, [ed. 2], 2--8, 10, 12--17, 19--21, 24--27, 107, 108, 164, & 198. 1949; R. T. Clausen, *Cornell Univ. Agr. Exp. Sta. Mem.* 291: 43. 1949; Moldenke, *Phytologia* 3: 71, 130--132, & 141 (1949) and 3: 283, 284, 291, & 374. 1950; Fern. in A. Gray, *Man. Bot.*, ed. 8, 1209, 1210, & 1612, fig. 1464. 1950; Zim & Martin, *Flowers* 60. 1950; Westcott, *Pl. Disease Handb.* 657. 1950; M. S. Keith, *Kodachr. Ser. Wild Fls. Ward's Nat. Sci. Estab.* LX68-83 & LX68-84. 1950; M. T. Grant, *Proc. Iowa Acad. Sci.* 57: 118. 1950; Moldenke, *Revist. Sudam. Bot.* 8: 173. 1950; Deam, Yuncker, & Friesner, *Proc. Ind. Acad. Sci.* 59: 51 (1950) and 60: 87. 1951; Moldenke in Chittenden, *Roy. Hort. Soc. Dict. Gard.* 4: 2209 & 2211. 1951; Gottscho, *Wildfls.* 55 & 192. 1951; Moldenke, *Phytologia* 3: 450 & 467 (1951) and 4: 67. 1952; H. N. & A. L. Moldenke, *Pl. Bible* 5 & 326. 1952; Moldenke in Gleason, *New Britton & Br. Illustr. Fl.*, print. 1, 3: 126, 129, & 130. 1952; T. Hofmann, *N. Y. Herald-Trib.*, sect. 4, p. 13, July 27. 1952; Wherry, *Bull. Torrey Bot. Club* 80: 228. 1953; Moldenke, *Phytologia* 4: 185 & 450 (1953) and 5: 94. 1954; Hylander, *Macmil. Wild Fl. Book* 337, pl. 166L. 1954; Grant & Thorne, *Proc. Iowa Acad. Sci.* 62: 208. 1955; Hocking, *Dict. Terms Pharmacog.* 74, 110, 114, 209, & 240. 1955; *Canadian Nature* 17: 104, pl. 12. 1955; R. F. Thorne, *Proc. Iowa Acad. Sci.* 62: 181. 1955; Moldenke, *Inform. Mold. Set* 51 Spec. 4. 1956; St. John, *Fl. Southeast. Wash. & Adj. Ida.*, rev. ed., 352. 1956; Moldenke, *Notes Pl.* 2: 41. 1957; Lehr, *Bull. Torrey Bot. Club* 84: 312. 1957; *Mich. State Univ. Park Manag. Ser. Bull.* 5: 5 & [48]. 1957; Moldenke, *Am. Midl. Nat.* 59: 342, 343, 346, 347, 349, & 353--360. 1958; Strausbaugh & Core, *Fl. West Va.* 3: 774 & 775. 1958; R. S. Lemmon, *Wildfls. Prairie* 16--17, pl. 11. 1958; Ahles, Bell, & Radford, *Rhodora* 60: 22. 1958; Moldenke in Gleason, *New Britton & Br. Illustr. Fl.*, print. 2, 3: 126, 129, & 130. 1958; Mattoon, *Pl. Buyers Guide*, ed. 6, 287. 1958; Moldenke, *Résumé* 4--11, 13, 15--26, 29, 31--33, 55, 129, 130, 223, 365, 366, 368, 371, 372, 421, & 472. 1959; Moldenke, *Résumé Suppl.* 1: 1 & 2 (1959) and 2: 1--3, 10, & 11. 1960; H. V. Sm., *Mich. Wildfls.* 313, 314, & 465, pl. 154. 1961; H. & L. Kemp, *Bull. Torrey Bot. Club* 88: 60. 1961; Nair & Rehman, *Bull. Nat. Bot. Gard. Lucknow* 76: 3 & 5, fig. 5. 1962; Moldenke, *Résumé Suppl.* 3: 1, 2, 4--6, 8, 33, 36--38, 41, & 42 (1962), 4: 1, 3, 13, 14, 16, & 20 (1962), 5: 1, 3, 5, & 7 (1962), and 6: 1, 2, & 8. 1963; Gleason & Cronquist, *Man. Vasc. Pl.* 579 & 580. 1963; Coon, *Using Pl. for Heal.* 220. 1963.
- Illustrations: Herm., *Parad. Bat.*, ed. 1, pl. 242 (1698) and ed. 2, pl. 242. 1705; Lindl., *Bot. Reg.* 13: pl. 1102 [in color]. 1827; Rattan, *Popular Calif. Fls.*, rev. ed. 8, 11. 1888; Dana,

How to Know Wild Fls., ed. 7, pl. 92. 1894; Wild Fls. Canada pl. 9 [in color]. 1894; Mill. & Whiting, Wild Fls. Northeast. States 486. 1895; Britton & Br., Illustr. Fl., ed. 1, 70, fig. 3059. 1898; Blanchan, Nat. Gard. 40 [in color]. 1900; L. H. Pammel, Bull. Iowa Agric. Sta. 70: 513. 1903; Selby & Hicks, Bull. Ohio Agric. Sta. 142: pl. 4 (1903) and 175: pl. 4. 1906; U. S. Dept. Agr. Farm. Bull. 260: 22. 1906; Clark & Fletcher, Farm Weeds Canada, ed. 1, pl. 54, fig. 31 (1906) and ed. 2, pl. 75, fig. 61. 1909; Beal, Mich. Weeds [Bull. Mich. Agric. Exp. Sta. 267:] 396. 1911; Beal, Ann. Rep. Mich. Agric. Sta. 25: 385. 1912; Creevey, Harper's Guide Wild Fls. 332. 1912; Britton & Br., Illustr. Fl., ed. 2, 3: 95, fig. 3554. 1913; L. H. Pammel, Iowa Geol. Surv. Bull. 4: 263 & 468. 1913; Canada Dept. Agr. [Seed Br.] Bull. S-8: 51. 1914; A. Georgia, Man. Weeds pl. 238. 1914; Palmer, Proc. Iowa Acad. Sci. 23: pl. 9. 1916; Blanchan, Wild Fls. [New Nature Lib. 6:] 40 [in color]. 1916; C. A. Reed, Fl. Guide 152 [in color]. 1916; House, Wild Fls. N. Y. 2: [Mem. N. Y. State Mus. 15:] pl. 183B [in color]. 1918; Lovell, Flower & Bee 255. 1919; Kanda, Bot. Gaz. 69: 64--65, fig. 54--59, 66, fig. 63, 67, fig. 75, & pl. 6, fig. 7. 1920; Pellett, Am. Honey Pl., ed. 1, 266. 1920; Blanchan, Wild Fls. Worth Knowing 270 [in color]. 1922; Pellett, Am. Honey Pl., ed. 2, fig. 181. 1923; Jepson, Man. Flow. Pl. Calif. fig. 806. 1925; E. J. Alexander, Addisonia 13: pl. 422 [in color]. 1928; Rydb., Fl. Prairies & Plains fig. 479. 1932; House, Wild Fls. pl. 183B [in color]. 1934; Junell, Symb. Bot. Upsal. 4: fig. 21. 1934; J. King, Wild Fls. at a Glance 42 [in color]. 1935; Dermen, Cytologia 7: 163, fig. 12. 1936; Hylander, World Pl. Life 443. 1939; Jepson, Fl. Calif. 3 (2): fig. 419. 1943; H. E. Stone, Fl. Chester Co. 1125. 1945; Seed Trade Buyers Guide 86. 1945; Pellett, Am. Honey Pl., ed. 4, 420. 1947; Hausman, Begin. Guide Wild Fls. 303. 1948; T. L. Keith, Kodachr. Ser. Wild Fls. Ward's Nat. Sci. Estab. LX68-83 & LX68-84 [in color]. 1950; Fern. in A. Gray, Man. Bot., ed. 8, fig. 1464. 1950; Zim & Martin, Flowers 60 [in color]. 1950; Gottscho, Wildfls. 55. 1951; Moldenke in Gleason, New Britton & Br. Illustr. Fl., print. 1, 3: 130. 1952; Hylander, MacMil. Wild Fl. Book. pl. 166L [in color]. 1954; Canadian Nature 17: pl. 12 [in color]. 1955; Moldenke in Gleason, New Britton & Br. Illustr. Fl., print. 2, 3: 130. 1958; R. S. Lemmon, Wildfls. Prairie pl. 11 [in color]. 1958; Strausbaugh & Core, Fl. West Va. 3: 775. 1958; H. V. Sm., Mich. Wildfls. pl. 154. 1961; Nair & Rehman, Bull. Nat. Bot. Gard. Lucknow 76: 3, fig. 5. 1962.

Slender perennial herb, 1--2.3 m. tall, mostly unbranched or short-branched only above, varying from glabrous to more or less sparsely rough-pubescent; roots fibrous, with perennial rootstocks; stems sometimes 5 or 6 per plant, usually 4--15 dm. tall, sometimes taller, mostly simple or else branched above, purplish, leafy, obtusely tetragonal, sulcate, slender, stiff, erect, roughish-puberulent or rough-pubescent, with short or minute and stiff antrorse hairs; branches axillary, short, ascending or erect, the lower ones often leafy and undeveloped; leaves decussate-opposite; petioles slender, 1--2.6 cm. long, narrowly margined, rough-

hirsute; leaf-blades membranous, dark-green above, paler beneath, lanceolate to oblong-lanceolate or occasionally ovate-lanceolate, 4--18 cm. long, 5--7.5 cm. wide, acute or subacuminate to gradually acuminate at the apex, narrowed or rounded at the base or even cuneately prolonged into the petiole, serrate to coarsely serrate or incised, sometimes sharply and irregularly incised-serrate or incised-dentate, rarely deeply pinnatisect or pinnatifid, the lower only often hastately 3-lobed at the base, varying from glabrous or strigillose to occasionally rough-pubescent on both surfaces, the venation strong, impressed above, prominent beneath; spikes strict, erect or even stiffly erect, linear, usually numerous, paniculate or paniculate-corymbose, pedunculate, short and compact, opposite, borne at the tips of the stems and branches, usually one spike terminal, with 2 to several opposite pairs directly beneath it, 6--13 cm. long, the rachis flowerless for the lowest 2.5 cm., densely many-flowered above and subtended by a minute subulate bractlet; flowers small, sessile, about 4 mm. long; floral bractlets ovate or lanceolate-subulate, commonly a little shorter than or nearly as long as the calyx, acuminate at the apex; calyx green, turning greenish-purple, 2--3 mm. long, minutely pubescent on the outside, 5-ribbed, its teeth or lobes acute, unequal, with short subulate tips, more or less connivent; corolla hypocrateriform, varying from blue, deep-blue, violet-blue, or light purplish-blue to bluish-purple, blue-purple, blue-violet, dark blue-violet, bluish-lavender, or intense bluish-purple, its tube curved, somewhat longer than the calyx, pubescent on the outside, the throat marked with a ring of hairs, the limb 2.5--5 mm. wide, the lobes rounded, the 2 upper ones smaller; mature fruits crowded and overlapping on the fruiting-spikes, each about 3 mm. long, obtuse at the apex, obtusely tetragonal; cocci pale-brown or sometimes brown, linear, 1.5--2 mm. long, minutely puberulent, the dorsal side nearly smooth or very faintly striate with 3 ridges, the commissural face muriculate or almost smooth, sometimes reticulate at one end; chromosome number: $2n = 14$.

This common and widespread species grows naturally from Nova Scotia west to British Columbia and south to Florida, Texas, and Arizona. It is, however, quite rare and sporadic in the southeastern, southern, and southwestern states and rather local in the far west. Much of the peripheral material appears to be var. scabra Moldenke. Perry states definitely that it grows "throughout the United States", but we have no records of it as yet -- nor does she give any -- from Arkansas, Alabama, or Mississippi. Julius King, in the reference cited above (1935), reproduces a map showing this species as occurring in every state of the United States and in every Canadian province. It is hoped that curators of herbaria in which there are specimens of this species from provinces, states, and counties not blacked-out on our map will send such specimens to the author for verification and recording so that future editions of our map may be more complete. The specific name of the species is sometime uppercased for no valid reason.

Walpers (1845) places V. hastata in his Section Verbenaca, Sub-

section Inermes, Group Foliosae, Subgroup Micranthae, and Secondary Subgroup Holophyllae. Schauer (1847) admits that Lamarck's V. paniculata and Linnaeus' V. hastata are conspecific, but, curiously, adopts Lamarck's name as more appropriate, saying "V. hastata ne tanquam varietas quidem distinguenda, quum in eadem planta folia primordialis nunc hastata nunc subhastata nunc, et saepius, lanceolata basi cuneata invenias. Nomen aptius etsi recentibus praeferendum habui. Maxime recedit a sequenti [V. urticifolia] foliis, spicis, floribus, panicula."

Common names recorded for this plant are "American vervain", "blue verbena", "blue-verbena", "blue verbenna", "blue vervain", "blue vervian", "clowne's all-heal of New England", "common vervain", "compound-panicled vervain", "Eisenkraut", "false vervain", "halberd-leaved verbena", "halberd-leaved vervain", "halbert-leaved vervain", "hoary vervain", "holy herb", "iron-weed", "ironweed", "panicled vervain", "purple verbena", "purple vervain", "purvain", "shades", "simpler's joy", "simpler's-joy", "simplers' joy", "tall blue vervain", "verbena", "vervain", "vervaine bleue", "verveine bleue", "verveine hastée", "verveine paniculée", and "wild hyssop". It should be noted, however, that the name "false vervain" is applied also to V. litoralis H.B.K.; "hoary vervain" is more correctly applied to V. stricta Vent.; "holy herb" and "simpler's-joy" are wellknown old names for V. officinalis L.; "common vervain" is applied to V. officinalis and to V. urticifolia L.; and "verbena" and "vervain" apply to many species as well as to the genus as a whole. The name "iron-weed" is often given as a name for the genus as a whole -- from the German name "Eisenkraut" -- but is also a recognized name for the members of the composite genus Vernonia Schreb., in association with which V. hastata often grows.

The species is quite variable in pubescence and leaf-form. A form that is heavier and rougher than normal is well represented by J. H. Christ 5962 and Gaiser 1522W (but the latter collector's 490, 490G, 1763PE, and 2367RG, from the same area, are normal). Very pubescent plants are represented by F. E. Leonard s.n. [Salt Lake City, July 17, 1884] and a very conspicuously canescent form by C. B. Maguire 20098, E. Runyon 280, and Over 17223. In general, the more densely pubescent forms are more western in distribution and may possibly be worthy of nomenclatural designation. Many, if not all of them, may prove to belong to var. scabra, a taxon described since most of the specimens of V. hastata herein cited were examined and annotated. The leaf-surfaces of English 477, C. M. Rogers 4981, O. A. Stevens s.n. [Kindred, Aug. 20, 1944], and Tidestrom 1718, all deposited in the United States National Herbarium, seem rougher than normal, and these specimens, too, may very well better be placed in var. scabra.

Some leaves on L. H. Pammel s.n. [Jul. 18, 1920] are beautifully pinnatisect; on Pammel & Blackwood 3638 they are all deeply

pinnatisect; on Tolstead s.n. [Aug. 1, 1935] some are deeply pinnatisect; Fink s.n. [Fayette, July 19, 1899] also shows pinnatisect leaves. L. H. Pammel s.n. [Dubuque, 6/20/91] has all the leaves very decidedly hastata and laciniate-dentate and may actually be a hybrid with V. officinalis. Beautifully hastate leaves are also seen on B. H. Patterson s.n. [July 12, '86], Geyer s.n. [Beardstown, July 1842], B. T. Butler 4292, J. L. Sheldon s.n. [Lincoln, July 28, 1898], and Schuetz s.n. [Green Bay, Aug. 4, 1887]. Some hastate leaves are also seen on R. F. Cain 281, while on J. F. Macbride 304 they are deeply cut.

The type of V. hastata var. laneeolata was collected by Charles Horton Peck at Boston Corners, Columbia County, New York, and is deposited in the herbarium of the New York State Museum at Albany, while that of the so-called V. hastata x stricta Elmore was collected by Clarence Jerome Elmore at Talmage, Otoe County, Nebraska, in 1890, and is deposited in the herbarium of William Jewell College at Liberty, Missouri. The actual type of V. hastata is a specimen in the Linnean Herbarium at London -- an isotype at Stockholm bears on its obverse side, in pencil, the note "cfr. Verb. 10 hastata L. sp. pl. 20" and in ink (in an unknown handwriting) "Verbena paniculata Lam." followed in pencil by "=hastata L. K" and in ink again (in the same unknown handwriting) "Verbena", followed in ink (in Linnaeus' handwriting) "10 hastata" followed by (in the same unknown hand) "Linn." On the reverse side, in pencil, is inscribed "Linné herb." and in ink "Herb. Alstroemerii" and, also in ink (in Dahl's handwriting) "a Linne f." The Nietzel specimen in the same herbarium is inscribed on the obverse side "10 hastata? K", and on the reverse side, in pencil, "Linné herb." and in ink (in Montin's handwriting) "Verbena (hastata) tetrandra, spicis longis acuminatis, foliis hastatis. Syst. nat. ed. 13. n. 11. Habitat in Canadae humidis. || Specimen ex horto Upsal. communicavit hortul Nietzel."

Sabbat (1775) placed Verbena americana, spici multiplici, foliis urticae angustissimis, floribus caeruleis Herm. and V. altissima, americana Herm. under V. bonariensis L., apparently in error. His color plate 54, inscribed with Hermann's names, is plainly V. bonariensis. Hermann apparently had two plants which he thought were distinct, one with blue and the other with purple flowers; Boerhaave kept them separate, but Linnaeus made the purple on a variety β of the blue in his Hort. Ups. (1748). Hermann also had a white-flowered one which is probably V. hastata f. albiflora Moldenke. Linnaeus (1737) placed "Verbena americana altissima, urticae foliis angustioribus, spicis brevibus, floribus caeruleis Boerh." as a variety α of "Verbena foliis ovatis, caule erecto, spicis filiformibus" (which is V. urticifolia L.).

In spite of the quite characteristic appearance of this species, specimens of V. hastata have been misidentified and distributed in herbaria under the names V. angustifolia Michx., V. biserrata H.B.K.,

V. bracteosa Michx., V. canescens H.B.K., V. caroliniana Michx., V. hasta L., V. hastata x urticaefolia Chase, V. hastata x urticifolia Eggert, V. officinalis L., V. rugosa Michx., V. simplex Lehm., V. spura L., V. striata Vent., V. stricta Vent., V. stricta x hastata Eggert, V. stricta x urticifolia Stevens, V. urticaefolia L., V. urticifolia L., V. urticifolia x hastata Schneck, "Verbenaceae Hastata", Buchnera americana L., Teucrium occidentale A. Gray, and Veronica sp.

On the other hand, the Havard s.n. [San Antonio] and Vasey s.n. [Socorro, May 1881], distributed as V. hastata or as V. pinnatifida, are actually V. ambrosifolia Rydb.; A. E. Radford 514 is V. bonariensis L.; Lapham s.n. [Milwaukee] and A. B. Seymour 1062 are V. engelmannii Moldenke; Chesnut 1 is V. lasiostachys Link; Drew s.n. [Oakland, June 25, 1889] and Pupils L. A. High School s.n. [near "The Palms", May 1901] are V. lasiostachys var. septentrionalis Moldenke; Collector undesignated s.n. [Florida] is V. neomexicana var. xylopoda Perry; T. J. Hale s.n. [Madison] is V. perriana Moldenke; K. Brandegee s.n. [May 1916] and Jepson s.n. [Alamo Creek, June 8, 1884] are V. robusta Greene; Fassett & Wilson 9776 and Skavlem s.n. [Janesville, July 23, '89] are V. rydbergii Moldenke; Bakken 122, W. S. Blaine s.n. [Durant, June 23, 1935], Clevenger s.n. [Columbus, June 21, 1904], Cory 50269, J. Davis 40 & 4461, Duan & Isely 5707, C. Epling s.n. [Post Falls, July 1929], Evers 198, Ferril s.n. [Sept. 1, 1902], Grinstead 85, Harding 59, Herb. Ill. State Mus. 15871, Herb. Univ. Calif. Los Angeles s.n. [Aug. 1937], Milburge 969, B. H. Patterson s.n. [Sept. 2, 1918], Piesbergen s.n. [July 2, 1942], F. J. W. Schmidt s.n. [Oct. 1, 1934], Warner s.n. [Liberty], J. M. Winter 20, and M. Zimmerman s.n. [Red House, Aug. 8, 1935] are V. stricta Vent.; J. M. Fogg 18013 is V. urticifolia L.; Ashe s.n. [Roan Mtn., July 1893] is V. urticifolia var. leiocarpa Perry & Fernald; Havard s.n. [San Antonio] is V. wrightii A. Gray; H. B. Parks s.n. [White Creek, 9-7-47] is V. xutha Lehm.; and Radford & Stewart 351 is Stylodon carneus (Medic.) Moldenke; while Cory 50298, Elmer 537, J. M. Johnson 254, Leiberg 2630, and O. A. Stevens s.n. [Aug. 4, 1936] are all definitely V. hastata var. scabra Moldenke.

Verbena hastata inhabits a great variety of situations, but usually wet, swampy, marshy, damp grassy, or boggy places, but sometimes also plain grassy, waste, or even dry waste places or dry sand. It has been collected in woods and open woods, in low woods along streams, in thickets and moist thickets, swales, boggy clearings, and orchards, on low, moist, or wet prairies, in bogs, cold bogs, and swamps, in wet and swampy spots, and on creek-bottoms, creek-banks, and sand flats. It apparently inhabits low, swampy, or dryish open ground and damp open ground near streams, low marshy land, alluvial mud, and lakeshore peat. Col-

lectors report it from low, grassy, wet, boggy, moist, and bottom-land pastures, from low, moist, wet, moist grassy, boggy, swampy, alluvial, and upland meadows, from beaches, sand beaches along rivers, and the sandy beaches of ponds, from wet moist, and roadside ditches, the edge of lotus ponds, and the banks of ditches. They have found it along roadsides, grassy roadsides, sandy roadsides, fencerows, brooksides, streamsides, and field drainage ditches, even from along more or less dry streams, and on streambeds, from the edges of lakes and on dry lake beds, in deep stony cuts and small bogs, from lowlands, swampy lowlands, bottomlands, pasturelands, and waste land, from marshes as well as from salt, tidal, and reclaimed marshes and springy areas, from the grassy margins of sphagnum bogs, open pond banks, grassy openings in thickets, drier areas of bogs, shady stream banks, swampy hillocks, the borders of brackish ponds and of salt marshes, the edge of open swamps and of brackish marshes, the peaty borders of marshes and dry peaty borders of brackish marshes. It has been collected on sand mounds, ridges, and hills, along ditches in open prairie fields, on ledges, on or among sand dunes, on sand bars, dry open roadsides, in ditches, at the edges of ponds and the bottoms of small ravines, at the edge of runs, on very dry lots, along creeks in open woods, at the edges of mowed fields, and on the open range, on rich knolls and on hummocks in marshes. It apparently inhabits moist or wet soil, wet rich soil, clay, sandy or dry sandy soil, alluvial soil, moist loam, sand, imperfectly drained sandy clay soil, and the sandy soil of lake margins, open and wet open fields, open woods, low and damp fields, old or abandoned fields, dry fields, pasture or abandoned pasture fields, riverbanks and riverbottoms, irrigation ditch banks, moist, stream, canal, and rocky river banks, the sandy rims of rivers, lake and sandy lake shores, rocky or old gravelly shores, as well as sandy and rocky shores or sand-and-gravel shores. It has been found at altitudes of practically sea-level to 7000 feet, flowering from June to October, or, in the far south, as early as April, and fruiting from July to October.

Darlington (1936) says that it is common on the floodplain of the Carp River in the Porcupine Mountains of Michigan, while Grassl reports it as "common in moist places at edge of marshes" in that state. Schallert reports that in Wisconsin it is found "in moist fields, meadows, and waste places, a wild flower and weed, not obnoxious, the root and herbage used unofficially medicinally". H. V. Smith (1961) says that the Amerinds made a tea from the leaves in Michigan and used the plant in treating nose-bleed; also that it is readily grown in a moist garden. Gates (1940) calls it a hemicyptophyte from "low open woods and thickets, wet prairies, and waste ground" throughout Kansas "except the westernmost counties". McKee describes it as "common in pastures" in Newton County, Indiana, and Welch as "common along roadsides" in Jasper County, while Deam found it "covering an area of about half acre in low places along roadside and in an adjacent field" in the same state. In Illinois it is said by Jones (1945) to be "common" along "roadsides and fields", while Gates

found it "in Iris association on beaches". In Connecticut it was found by Dwyer to be associated with daisy [Leucanthemum vulgare] and Rudbeckia hirta in sandy soil", while in Pennsylvania it was found by Benner in "low ground especially in waste places, frequent" and by H. E. Stone in "swampy meadows and along streams, frequent." In Iowa it is said by Hayden to be found "in moist soil in pastures, common near ponds and swales", while Pammel says it is "a common weed in pastures, low ground, associated with Vernonia fasciculata, Scirpus atrovirens, Cyperus esculentus, and Lythrum alatum" and in "low grounds, Iowa drift sheet, associated with Carex vulpinoidea, Verbena urticifolia, Epilobium coloratum, Polygonum acre, Alnus incana, and Aster novae-angliae" and "a weedy plant in low ground, pastures, etc., associated with Silphium perfoliatum, Rudbeckia laciniata, Salix longifolia, and Solidago serotina", and Pammel & Spiker found it in "black soil, low ground in pastures, associated with Vernonia fasciculata, Poa pratensis, Cyperus esculentus, and Scirpus atrovirens." Benson found it in "riverbank thickets in treeless and transition zone" in Oregon, and "in sandy soil, Carolinian zone" in New York. In Colorado Ewan says it is "local, only in heavy herbage of sinks among sandhills" or "frequent as colonies along barrow ditches beside railroad grades", while in Minnesota Mearns says it is "common in wet places." In Washington it is said by Beattie & Chapman to be "common on hills", while St. John reports it as "occasional in meadows or by stream banks in Upper Sonoran zone" M. E. Jones describes it as a plant of the "middle temperate life zone". In New York it is said by Carpenter to be "common along roadsides of the lower altitudes" and Weber says "common in fields". Tosh reports it as "common in all low wet land" in Raleigh Count, West Virginia. In Iowa it was found by Pammel & Zimmerman "in low ground with Convolvulus sepium and Helianthus grosseserratus"; in Oklahoma it was found by Hopkins "in moist damp copses among Salix"; in California it grows with Stachys and Scirpus according to Nobs & Smith; and in Kansas it is said to be "common in wet places in prairies" by Hancin. Small describes it as found "in sand and clay soil along roadsides through salt marshes" in New Jersey, while Maguire reports that in Utah it is "a common weed along canal banks", "frequent on ditch banks", "frequent in pastures and marsh lands", and "a common weed in wet places". In Michigan it was found by Hamerstrom in sandy loam soil with Asclepias syriaca, A. incarnata, Lycopus americanus, and Phleum pratense, while McVaugh describes it as "abundant at edge of swampy deciduous woods".

G. Johnson (1926) says that it flowers from June to September and is to be found "almost throughout the United States and Canada" in moist meadows, roadsides, and waste places. He says "for a description of this flower, its insect visitors, and the traditions clinging to its name, see page 185 of Nature Library volume on WILD FLOWERS. For color and appearance in natural surroundings, see

full-page color illustration facing page 176." In the "New Nature Library", however, in volume 6, by N. Blanchan (in my possession), the description to which he refers is on page 40 and the color plate is a half-page (not "full-page") facing that page. It is stated there that the flowers are pollinated by bees, which "are usually seen clinging to the blooming spikes, and apparently sleep on them." It is also stated there that "John Burroughs, ever ready to say a kindly, appreciative word for any weed, speaks of its drooping, knotted threads, that 'make a pretty etching upon the winter snow.'" The reference here is to the fruiting spikes, which, however, are not "drooping", but firmly erect. Burroughs was probably referring to the spikes of V. urticifolia rather than those of V. hastata. There is no mention in Stapf's "Index Londinensis" of any color plate facing a page 176.

Palmer (1935) states that in Missouri V. hastata inhabits "low open woods, wet prairies, fields, and waste ground. Circum-neutral. General, but commonest in northern and central" portions of the state. In his 1916 publication he cites his nos. 189, 1085, 1086, and 2483 from Jasper County, not yet seen by me, and in his 1930 publication he cites his no. 23505 and C. K. Allen s.n. from Suffolk County, Massachusetts. Grant & Thorne (1955) record the species from Hancock County, Iowa, and cite their no. 14568; Loew (1949) records it from Huntington County, Indiana, and says it is "medicinal"; and C. N. Jones (1941) cites R. Walker s.n. from Hocking County, W. Goslin s.n. from Fairfield County, and L. E. Yarman s.n. from Knox County, Ohio. In his 1943 work he cites C. H. Jones s.n. from Marion County and in his 1945 work Harper & Konopka s.n. from Carroll County, Ohio. Schauer (1847) cites unnumbered "Bott" [=Boott?], Pursh, and Rafinesque specimens from "monosis Americae septentr." and an Engelmann collection from Missouri. Possibly his "Bott" citation refers to the same collection as the "Boott" collection cited below from the Stockholm herbarium, collected in Boston in 1816.

Jepson (1943) records V. hastata from Humboldt County, California; E. L. Braun (1943) records it from Boone and Morgan Counties, Kentucky; Deam, Kriebel, Yuncker, & Friesner (1945) record it from Delaware and Huntington Counties, Indiana; Stebbins (1929) records it from Mount Desert Island, Maine; and Tatnall (1947) from Wicomico County, Maryland. C. W. Lowe (1943) records it from "thickets and river valleys, frequent, eastern area - Norden, Riding Mt. Nat. Pk.", Manitoba. In Proc. Ind. Acad. Sci. 56: 110 (1947) it is recorded from Decatur County, Indiana, and in 60: 87 (1951) from Parke County. Ogden, Steinmetz, & Hyland (1948) record it from Androscoggin, Franklin, Kennebec, Knox, Lincoln, Sagadahoc, and Somerset Counties, Maine. Jepson states that the species was collected in the Grand Island, Lower Sacramento, region of California, in 1841 by the Wilkes Expedition. Allard & Leonard (1943) record it from Bull Run Mountain, Virginia [Prince William County?]. In Proc. Iowa Acad. Sci. 62: 181 (1955) it is said to be common in Johnson County, Iowa. It is recorded as ad-

ventive in England by Douglas H. Kent in a letter to me dated November 28, 1949; Mrs. Rothwell & Rayner s.n. is cited from Christchurch, South Hants, England, by Druce in Rep. Bot. Exch. Club Brit. Isles 1923: 205 (1924). Fernald (1921) says "not seen west of Hants County" in Nova Scotia.

The E. S. Steele 98, collected in Camden County, New Jersey, bears a misleading printed label reading "Plants of Pennsylvania"; J. Torrey 125, collected at Hoboken, New Jersey, bears a label reading "Hoboken, N. Y." and "Lect. circa Hoboken! in Canada." The "East Caledonia" County, Vermont, recorded for this species by me in my Résumé 5 (1959) is an error for Caledonia County. The Block Island, "Massachusetts", recorded on page 6 of the same work is an error for Block Island, Rhode Island, and the "Girard" County, Minnesota, recorded on page 19 also appears to be an error of transcription. There is no such county in the state, nor can I locate a town by that name there, nor a county by that name elsewhere.

The species is used locally in medicine in Florida, according to Curtiss, while in Michigan the leaves are "used to make vervain tea, an old-fashioned spring tonic". H. N. Webster (1942) says that it is "an emetic herb used from earliest times in Colonial medicine". Bausor (1937) reports that an infusion or fluid-extract of the herb is used as an expectorant and also to stimulate perspiration, while "large doses are emetic".

The Black 36-5881 from Ohio looks somewhat like xV. engelmannii Moldenke — as to the difference between V. hastata and xV. engelmannii, see my discussion of the latter in these notes. The Baldwin & Breitung 3356, distributed as V. hastata, is actually Veronica longifolia L., while C. M. Long s.n. [Owne Sound, Ont., 1873], also so distributed, is Veronicastrum virginicum (L.) Farwell, both in the Scrophulariaceae.

Verbena hastata apparently hybridizes freely with related species — its hybrid with V. carolina L. is xV. matritensis Moldenke, with V. hispida Ruiz & Pav. is xV. noacki Moldenke, with V. officinalis L. is xV. baileyana Moldenke, with V. simplex Lehm. is xV. blanchardi Moldenke, with V. stricta Vent. is xV. rydbergii Moldenke, and with V. urticifolia L. is xV. engelmannii Moldenke. MacDougal (1907) suggests that it also hybridizes with V. bracteata Lag. & Rodr. in the wild. However, he cites no specimens, gives no description of the supposed hybrid, and does not say that he actually ever saw any such hybrid plants. Briquet (1894) regarded V. pinnatifida Lam. as a hybrid between V. hastata and V. officinalis (that is, as what is now known as xV. baileyana), but this does not seem likely nor, if true, would it invalidate the latter name, since Lamarck did not propose it as a hybrid.

Nair & Rehman (1962) describe the pollen of a "V. pinnatifida" as "Size 43μ (range $42-46\mu$). Endocolpium lalongate ($5.2 \times 14\mu$).

Ectine surface psilate (very faint LO)." They base this on what appears to have been a cultivated specimen from Lucknow, India -- "N[ational] B[otanic] G[arden] 16673; Sl[ide] 2729". Not having seen this specimen, I am, of course, not at all certain that the information actually applies to V. hastata, a species not as yet known to me as cultivated in India -- while V. tenuisecta Briq., is there cultivated and might carelessly have been misidentified as "V. pinnatifida" if only the leaf character were considered.

It is worth pointing out here that the homonyms referred to in the synonymy of V. hastata, and elsewhere, are disposed as follows: V. lacunosa Mart. is Stachytarpheta lacunosa Schau.; V. lanceolata Willd. is V. litoralis H.B.K.; the V. pinnatifida of M. E. Jones is V. wrightii A. Gray, while that of Nuttall and of Schauer are V. bipinnatifida Nutt.; V. hastata x angustifolia Hill is xV. blanchardi Moldenke; the V. hastata x bracteosa Gates is V. bracteata Lag. & Rodr., while that of Pammel is xV. moechina Moldenke, and that of Rydberg and of Schnack are xV. perriana Moldenke; another "V. hastata x simplex Gates" is V. simplex Lehm.; V. hastata x spuria Haartman is xV. baileyana; the V. hastata x stricta Allen is V. stricta f. albiflora Wadmond, while that of Anderson, of Gates, and of Rydberg are xV. rydbergii, and that of Ravenel is Stylodon carneus (Medic.) Moldenke; the V. hastata x urticaefolia of Blanchard, of Chase, of Dutton, of McCoy, of Norton, of Pammel, and of Peck are all xV. engelmannii; V. hastata x urticifolia of Blanchard, of Dermen, of Eggert, of Farwell, of Perry, and of Pringle are all xV. engelmannii, while that of Gates is xV. illicita Moldenke; V. hastata var. oblongifolia Andrews is V. urticifolia, while that of Nuttall is xV. engelmannii; and V. urticifolia x hastata Gates is xV. engelmannii. In my Prelim. Alph. List Invalid Names 46 (1940) I followed Perry (1933) in placing V. hastata f. rosea Farwell and V. hastata var. paniculata f. rosea Farwell in the synonymy of V. hastata -- however, these are now regarded as being in the synonymy of V. hastata f. rosea Cheney. She followed Small & Heller in placing V. hastata var. oblongifolia in the synonymy of V. riparia Raf., but I am convinced now that it belongs with xV. engelmannii.

Briquet (1894) refers to Verbena pinnatifida Lam. as a hybrid between V. hastata and V. officinalis. I believe that this was merely a guess on his part because of the more or less lobed condition of the leaves, which Lamarck inaccurately described as "pinnatifid", on the plant in question. Lamarck's plant is probably only a form of the very common and variable V. hastata and I do not think it is of hybrid origin. Examination of Lamarck's type ought to settle this point. His original description is "Verbena pinnatifida. V. spicis filiformibus, foliis inciso-pinnatifidis grosse serratis. Ex America septentrionalis 4."

Briquet also keeps V. hastata and V. paniculata as separate species.

Roberts (1929) quotes Haartman (1751) to the effect that "Another hybrid, between Verbena hastata female and Verbena spuria male is stated to have originated naturally in the Botanical Garden [at Uppsala, Sweden] in 1748, perishing two years later. It is recorded as arising in the same bed with the two species named above, 'but not through dissemination, considering that no one had the seeds here hitherto, nor through a planting of it, since it had not previously been seen within the country.'" It should be noted that Roberts dates the L., Amoen. Acad. 3: 43 reference as "1764". This hybrid is now known as xV. baileyana Moldenke.

The Henderson 795 collection from "Columbia River Cascades", cited below from Wasco County, Oregon, may actually be from Hood River County, Washington — H. M. Gilkey, in a letter to me dated January 16, 1848, says that the species grows in both counties. In Castanea 9: 69 (1944) my no. 12024 is cited from Loudonville, Ashland County, Ohio, but it was actually collected at Rogersville, Holmes County. The reference is a typographic error for no. 12171. The C. & W. 232 cited below from Roberts County, South Dakota, was collected on Jones Island in Big Stone Lake and may have been from Big Stone County, Minnesota, instead. The Wright 553 cited below from Rolette County, North Dakota, was collected in the Turtle Mountains, which are 60 percent in that county and 40 percent in Bottineau County. The Jacobs 181 and A. S. Hitchcock s.n. [Douglas Co., 8.7.99], cited below as V. hastata, were regarded as V. urticifolia x hastata and as V. hastata x simplex respectively by Gates in his Kansas Flora.

Kausch s.n. [Rostock, 1869] is a mixture with V. officinalis; Clevenger s.n. [Fletcher, Aug. 13, 1897], A. Fitch s.n. [East Greenwich, 1865], and Brinton s.n. [8.9.1878] are mixtures with V. urticifolia; Van Vleet 399 is a mixture with V. simplex; Eggert s.n. [St. Louis, Aug. 8, 1875] is a mixture with xV. engelmannii; and E. W. Fell 57-736 is a mixture with xV. rydbergii. McVaugh 14767a is not at all typical — its leaves resemble those of V. urticifolia, but the corolla is said to have been blue-violet.

The physico-chemical properties of V. hastata in relation to phytogeography are discussed by J. A. Harris (1934), based on his C.27628 from the drift zone of a sandy beach on the east shore of Lake Utah, west of Provo, Utah County, Utah. The pollination of the species is discussed by H. B. & J. L. Lovell in Torreyia 41: 184-187 (1939). Goss (1924) reports that he buried seeds of this species for 20 years — those buried 8 inches deep gave 82.5 percent germination, those buried 22 inches deep gave 71 percent germination, while those buried 42 inches deep gave no germination when dug up and replanted normally. Felt (1917) describes a white and pinkish gall, with a frost-like erineum and leaf-curl

involving the whole plant and apparently very destructive, caused by an acarid, Eriophyes sp., originally published by Chadwick (1908). Hocking (1955) says that the dried aerial portion of V. hastata is called "verbena" in the pharmaceutical trade and is used as a diaphoretic, expectorant, tonic, and vulnerary in diabetes. A bitter glucoside called "verbenalin" is found richest in the flowers.

The following fungi have been reported as infesting V. hastata in the wild: Aecidium verbenicola Ellis & Kellerm., Dicaecma verbenicola Arth., Puccinia sydowiana Diet., P. verbenicola Arth., P. vilfae Arth. & Holw., Didymella rehmi (J. Kuntze) Sacc., Erysiphe cichoracearum DC., Phyllosticta verbenicola Martin, Septoria verbenae Rob. (1847), and S. verbenae Gerard (1873).

The species was apparently first introduced into cultivation in 1748; Murray lists it as from British gardens in 1799. Bailey (1935) lists the following nurserymen and florists as offering its seeds to the trade: Bay State, L. E. Williams of Exeter, N. Y., Midwest Perennial Collectors of Stanford, Ill., George D. Aiken of Putney, Vermont, Snowberger, Buffalo City Hospital Botanic Garden, Alpine Nursery of Alpine, Tennessee, Lexington Botanic Garden of Lexington, Massachusetts, Cornamere, and Floraire. Mattoon (1958) states that it is offered to the horticultural trade by Charles H. Williams, Henderson's Botanical Gardens, Thompson & Morgan (England), and Saier (Dimondale, Michigan).

The collector, Josiah Thomas Scovell, has his surname misspelled "Scovill" in the University of Michigan herbarium. Miss Elizabeth Ann Bartholomew, in a letter to me dated March 1, 1961, states that Roy B. Clarkson's records indicate that his nos. 272 and 1585, from Pocahontas County, and 3109 from Randolph County, West Virginia, represent this species, but I have as yet not seen these collections.

Perry (1933) cites the following 175 additional specimens not as yet seen by me: NOVA SCOTIA: Hants Co.: Pease & Long 22350 (G). NEW BRUNSWICK: Gloucester Co.: Fowler s.n. [Napisiguit, 30 July 1873] (E). York Co.: Fernald & Pease 25247 [Nashwaak] (G). QUEBEC: Deux-Montagnes Co.: Louis-Marie 141 (G). Saint Maurice Co.: Chamberlain & Knowlton s.n. [Northwest of Three Rivers, 1 Aug. 1923] (G). Sherbrooke Co.: Knowlton s.n. [Ascot, 20 July 1923] (G). ONTARIO: Elgin Co.: G. L. Fisher s.n. [Aylmer, Aug. 5, 1912] (E). Frontenac Co.: Fowler s.n. [Kingston, Sept. 1897] (G). Renfrew Co.: Fowler s.n. [Ashdod, 24 July 1893] (E). MANITOBA: Macoun s.n. [Muskeg Island, Lake Winnipeg, 11 Aug. 1884] (G). SASKATCHEWAN: Bourgeau s.n. [1857--8] (G). VANCOUVER ISLAND: W. R. Carter s.n. [Alberni, July 1915] (G). MAINE: Aroostook Co.: Fernald s.n. [St. Francis, 5 Aug. 1893] (G). Piscataquis Co.: Fernald 296 (E, G). York Co.: Parlin s.n. [North Berwick, 28 Aug. 1891] (G); Williams s.n. [Eliot, 27 Aug. 1895] (G). NEW HAMPSHIRE: Cheshire Co.: Robinson 196 (G); Williams s.n. [Walpole,

28 July 1901] (G). Coos Co.: A. H. Moore 4316 (G). County undetermined: Jesup s.n. [bank of Connt. River] (G). VERMONT: Addison Co.: Williams s.n. [Weybridge, 8 July 1908] (G). Bennington Co.: Day 149 (G). Rutland Co.: I. W. Anderson s.n. [Mechanicsville, 6 Aug. 1906] (G); D. L. Dutton s.n. [Brandon, July 7, 1921] (E). Windham Co.: Robinson 153 (G). MASSACHUSETTS: Barnstable Co.: Cheney s.n. [Centreville, 20 Aug. 1902] (G); Greenman 398 (E, G); Williams s.n. [Centreville, 6 Sept. 1896] (G). Bristol Co.: Sturtevant s.n. [Nonquit, 29 Aug. 1888] (E). Hampden Co.: Morris s.n. [Monson, July 1897] (E); F. C. Seymour 511 (E). Hampshire Co.: Robinson 572 (G). Middlesex Co.: Faxon s.n. [Jamaica Plain] (G); Lane s.n. [Waverly, 10 Aug. 1878] (G); Morong s.n. [Melrose, 17 July 1876] (E); Sturtevant s.n. [South Framingham, 11 Aug. 1888] (E). Norfolk Co.: Williams s.n. [Dedham, 6 Oct. 1901] (G). Martha's Vineyard: F. C. Seymour 1324 (G). RHODE ISLAND: Providence Co.: Collins s.n. [Providence, 16 July 1892] (G); Olney s.n. [Providence] (G). Block Island: Fernald & Long 10263 (G). CONNECTICUT: Hartford Co.: Andrews s.n. [Southington, 31 July 1898] (G); Bissell s.n. [Southington, 10 Aug. 1897] (E). New Haven Co.: Eaton s.n. [New Haven, 1858] (E); Harger s.n. [Oxford, 11 Aug. 1888] (G). Tolland Co.: Weatherby 5076 (E). NEW YORK: Delaware Co.: Von Schrenk s.n. [Fleischmann's, 15 July 1892] (E). Essex Co.: Von Schrenk s.n. [Keene Valley, 1 Aug. 1891] (E). Queens Co.: Hexamer & Maier s.n. [Willets Neck, L. I., 8 Aug. 1853] (G). Saint Lawrence Co.: Mrs. O. P. Phelps 799 (G). Suffolk Co.: Von Schrenk s.n. [Peconic, 15 Aug. 1895] (E). Tompkins Co.: Dean & Thomas 4874 (G); MacDaniels 4873 (G). Washington Co.: J. A. Drushel 6351 (E). Westchester Co.: Stabler s.n. [Port Chester, 3 Sept. 1886] (G). NEW JERSEY: Middlesex Co.: J. A. Kelsey 173 (G). Union Co.: Trelease s.n. [Plainfield, 9 Aug. 1877] (E). PENNSYLVANIA: Dauphin Co.: J. K. Small s.n. [near Harrisburg, 13 July 1888] (G). Perry Co.: A. A. Heller 14222 (E). Philadelphia Co.: Greenman 1273 (G); Redfield s.n. [Fairmont Park, 22 July 1871] (E). DELAWARE: New Castle Co.: Tidestrom 11551 (G). MARYLAND: Harford Co.: Shull 156 (E). Howard Co.: Arsène 672 (E). DISTRICT OF COLUMBIA: I. Blanchard s.n. [11 July 1891] (E). VIRGINIA: Elizabeth City Co.: W. Palmer s.n. [Langley, 10 Aug. 1901] (W). Smythe Co.: J. K. Small s.n. [July 30, 1892] (E, G). WEST VIRGINIA: Barbour Co.: A. H. Moore 2569 (G). Pocahontas Co.: Berkley 1304 (E). Woods Co.: Pollock s.n. [7 Aug. 1897] (E). FLORIDA: Franklin Co.: A. W. Chapman s.n. [Apalachicola] (E). OHIO: Cuyahoga Co.: Greenman 1377 (E), 1379 (E, G), 1382 (E). Portage Co.: Webb 5441 (G). County undetermined: Riehl s.n. [dry places, July] (E). ILLINOIS: Cass Co.: Geyer s.n. [Beardstown, July 1842] (E). Champaign Co.: H. A. Gleason 1945 (G). Cook Co.: Greenman 1953 (E); H. H. Smith 5654 (G); Steele 106 (E). Kankakee Co.: Sherff

1649 (E). Pike Co.: Davis 3565 (E). Saint Clair Co.: Engelmann s.n. [banks of the Mississippi, opposite St. Louis, July 1842] (E). INDIANA: Lake Co.: Lansing 2805 (G). IOWA: Boone Co.: L. H. Pammel 1806 (E). Decatur Co.: J. P. Anderson s.n. [July 13, 1903] (E). Poweshiek Co.: M. E. Jones s.n. [Grinnell, Aug. 1877] (E, G). Story Co.: Bessey s.n. [Ames, Sept. 1873] (G); L. H. Pammel 78 (E). TENNESSEE: Carroll Co.: Eggert s.n. [Hollow Rock, 5 Aug. 1897] (E). McNairy Co.: S. M. Bain 444 (G). MICHIGAN: Berrien Co.: Lansing 3241 (G), s.n. [New Buffalo, 20 July 1911] (G). Emmet Co.: F. C. Gates 10708 (E). Marquette Co.: Barlow s.n. [Turin, 9 July 1901] (G). Van Buren Co.: Lansing 3340 (G). WISCONSIN: Buffalo Co.: Fassett & Hotchkiss 3322 (G). Sauk Co.: Eggert s.n. [near Mirror Lake, July 1903] (E). Shawano Co.: E. J. Palmer 28738 (E). MINNESOTA: Becker Co.: M. L. Grant 3073 (E, G). Hennepin Co.: Ballard s.n. [Swan Lake, July 1892] (G). Stearns Co.: Chandonnet s.n. [Collegeville, 29 July 1912] (E). NORTH DAKOTA: Benson Co.: Lunell s.n. [peninsula of Lake Ibsen, 1 Aug. 1899] (G). Grand Forks Co.: Brannon 128 (E). Richland Co.: H. F. Bergman 2335 (E). SOUTH DAKOTA: Brookings Co.: Johnson s.n. [Oakwood Lakes, 27 July 1903] (E); Thornber s.n. [Brookings, 1 Aug. 1893]. Kingsbury Co.: Thornber s.n. [Iroquois, 9 Aug. 1894] (G). Sanborn Co.: Visher 4439 (E). KANSAS: Johnson Co.: A. S. Hitchcock s.n. [Olathe, Aug. 1892] (E). Osborne Co.: Shear 202 (G). Reno Co.: White 174 (E). Riley Co.: J. B. S. Norton 390 (E, G). MISSOURI: Clark Co.: B. F. Bush 9165 (E). Jackson Co.: B. F. Bush 2214 (E). Jasper Co.: E. J. Palmer 197 (E), 198 (E), 1085 (E), 10568 (E); Trelease 716 (E). Marion Co.: J. Davis 3192 (E), 3578 (E), 3590 (E), 3817 (E). Saint Louis: Eggert s.n. [St. Louis, 12 Aug. 1877] (E, Po); Engelmann 337 (E), s.n. [near St. Louis, Sept. 1841] (E), s.n. [St. Louis, Aug. 1861] (G); Kellogg 1131 (E), s.n. [Allenton, 18 June 1896] (E); Lindheimer s.n. [St. Louis, July 1839] (E). IDAHO: Ada Co.: J. A. Clark 253 (E, G). Canyon Co.: Macbride 304 (E). WYOMING: Sheridan Co.: A. Nelson 2258 (E, G), 8439 (E). UTAH: Salt Lake Co.: Pammel & Blackwood 3638 (G). COLORADO: Adams Co.: E. L. Johnson 507 (E). Denver Co.: Eastwood 41 (E, G). Fremont Co.: Brandegge s.n. [Canon City, 1872] (E). Larimer Co.: Grandall 2014 (G). NEBRASKA: Howard Co.: Bates s.n. [St. Paul, 24 July 1909] (G). Lancaster Co.: H. J. Webber s.n. [Lincoln, 9 July 1885] (E). Nuckolls Co.: Hedgcock s.n. [Aug. 1899] (E). Thomas Co.: Rydberg 1515 (G). County undetermined: Hayden s.n. [Dickson's Bluffs on the Missouri, 12 July 1853] (E). OKLAHOMA: Ellis Co.: G. W. Stevens 2901 (G). Grant Co.: G. W. Stevens 1791 (E, G). Harper Co.: Stratton 400 (E). TEXAS: Oldham Co.: Ferris & Duncan 3513 (E). NEW MEXICO: County undetermined: C. Wright 1498 (D, GO). ARIZONA: Yavapai Co.: Coues & Palmer 279 (E). WASHINGTON: Okanogan Co.: Elmer 537 (E). Stevens Co.: Kreager 469 (G). Walla Walla Co.:

Savage, Cameron, & Lenocker s.n. [Walla Walla, July 1898] (E).
 Yakima Co.: Brandegge s.n. [Yakima region, 1882] (E); Cotton 1396
 (G). OREGON: Marion Co.: J. C. Nelson 1804 (G). Multnomah Co.: T.
Howell 292 (G); E. P. Sheldon 11167 (E, G). Umatilla Co.: Leiberg
2630 (G). She says "This rather distinct species shows a tendency
 to blend with several members of the Verbenaca in the region of
 the Middle States. Some botanists have regarded the variability
 in the compactness and the profusion of the inflorescence, as
 well as the tendency of the leaves to develop hastate lobes near
 the base, as being of nomenclatural value. Unfortunately in the
 rather complete series of specimens at hand, the writer has not
 found any combination of characters varying greatly in one dir-
 ection; and, at the present time, sees no reason to maintain
 other than the specific category."

In all, 2409 herbarium specimens, including the type collec-
 tions of almost all the names involved, and 12 mounted photo-
 graphs of this species have been examined by me.

Citations: NOVA SCOTIA: Cumberland Co.: Schofield 4235 (Vi).
 Kings Co.: D. H. Webster 79 (Vi). Pictou Co.: C. B. Robinson 521
 (N). NEW BRUNSWICK: Carleton Co.: Dore & Gorham 45854 (Rf, Vi, W-
 2034268); Slipp s.n. [July 10, 1952] (Vi). QUEBEC: Argenteuil Co.:
B. J. Harrington s.n. [St. Andrews] (Mm); W. B. McConnell s.n.
 [Chatham, June 29, 1870] (Mm--22305). Assomption Co.: Louis-Marie,
Dudemaine, & Laporte 1151 (Du--283367); Tardif 18 (Vi). Beauce
 Co.: Anselme 344 (Um--227). Chambly Co.: Marie-Victorin 910 (Vi--
 86), 8328 (Vi), 8940 (Vi), 9622 (In, Um--222, Vi), s.n. [Longueu-
 il, Sept. 1915] (W--872570); Morin 206 (Vi). Deux-Montagnes Co.:
Louis-Marie 24156 (Um--221); Major-Barnabé 1030 [18 Sept. 1940]
 (Vi). Gatineau Co.: Jenkins, Bayly, & Turnau 3306 (Bm). Hochelaga
 Co.: Lanouette s.n. [St. Henri, 12-7-32] (Um--214). Jacques Car-
 tier Co.: Degener & Degener 26129 (N); Herb. Mus. Coll. St. Lau-
rent s.n. [Montreal, Juil. '90] (Vi); Kucyniak 56 (Vi); Major-
Barnabé 1030 [24 aout 1940] (Vi); Massicotte s.n. [Montreal, ju-
 illet 1899] (Vi); Rouleau 1075 (Um--256), 2062 (Um--257); E. Roy
3001 (Vi). Montmagny Co.: Marie-Victorin, Rolland-Germain, Rous-
seau, & Meilleur 40025 (Um--213). Papineau Co.: Ross & Rouleau 1
 (Um--228). Richmond Co.: N. K. Berg s.n. [Danville, Aug. '94] (C);
Redpath s.n. [Melbourne, July 1872] (Mm--4649). Rouville Co.:
Gilles 25700 (Um--226). Saint Maurice Co.: Stanislas 602 (Um--217,
 Um--218, Um--219). Shefford Co.: Fabius 409 (Vi); Laurent 19 (Vi).
 Sherbrooke Co.: Doucet & Beaulieu s.n. [Sherbrooke, 15 aout 1955]
 (Ca--72391); Herb. Montreal Nat. Hist. Soc. s.n. [Ascot, 1850]
 (Mm--22632). Terrebonne Co.: Meilleur 560 (Mg). Trois Rivières
 Co.: F. Joseph s.n. [Aout 1925] (Vi--88). Vaudreuil Co.: E. Roy
2367 (Vi), 3312 (Vi), 3318 (Vi, Vi, Vi), 3333 (N, Vi, W--2096467),
3847 (Vi), 4034 (Vi, Vi). Ile des Soeurs [Verdun Co.]: Vincent s.
n. [Eté 1942] (Vi). County undetermined: A. F. Holmes s.n. [below

Quesnel's] (Mm—359); C. C. Stewart s.n. [Brownsburg, June 23rd 1891] (Dt). ONTARIO: Algoma Dist.: Grassl 5926 (Mi); Prettyman 904 (Bt—40264). Bruce Co.: R. Campbell s.n. [Chesley] (Mm—20481); Krotkov 9347 (N, N, W—1652593). Carleton Co.: Calder 3246 (Ca—882650); Macoun 81042 (Cm); Rolland-Germain 6168 (Vi), 6193 (Or—13555). Elgin Co.: G. L. Fisher s.n. [Aylmer, Aug. 5, 1912] (Ur), s.n. [St. Thomas, Aug. 1, 1908] (B). Essex Co.: Le-nander s.n. [Windsor, Aug. 21, 1933] (S); B. H. Patterson s.n. [Windsor, July 12, '86] (Cm). Frontenac Co.: J. Fowler s.n. [Kingston, July 31, 1897] (W—605753). Grey Co.: Mauger 82 (Vi). Huron Co.: Grassl 5906 (Mi). Kenora Co.: Buller s.n. [Kenora, July 1918] (Wp, Wp), s.n. [Kenora, Sept. 1918] (Wp), s.n. [Minaki] (Wp). Lambton Co.: Gaiser 490 (Gp, Gp, Gp, Mm), 1615PE (Gp, Gp, Gp, Mm), 1763PE (Gp, Gp, Gp, Mm), 2367RG (Gp, Mn); Gaiser & al. 490G (Gp). Leeds Co.: M. Edmondson s.n. [11.VII. 1898] (N); Marie-Victorin, Rolland-Germain, Rouleau, & Raymond 56833 (Vi), 56851 (Vi). Middlesex Co.: W. Dearness 80 (Mg), 85 (Mg). Perth Co.: Shields 185 (Vi). Prescott Co.: Dunbar 67 (Go); Rouleau 134 (Um—49230). Stormont Co.: L. Jenkins 8269 (Hi—186971). Wentworth Co.: Hood-less s.n. [Hamilton] (Se—14936). York Co.: R. F. Cain 281 (Bt—16552); Mauger 4m (Vi). Georgian Bay Island E.9: E. D. McDonald Jr. 254 (W—1888624). Toronto Island: C. W. Armstrong s.n. [Aug. 20, 1892] (W). Walpole Island: Gaiser 1522W (Gp, Gp, Gp, Mm), 2391 (Gp, Gp, Mm). Wolf Island: J. Fowler s.n. [July 1, 1895] (W—261035). County undetermined: T. W. Edmondson 2585 [Haley's Station] (N); J. Fowler s.n. [Almonte, July 7, 1898] (W—430868); A. Gray s.n. [Rochester] (S). Manitoulin Island: Grassl 5924 (Mi). MANITOBA: Lisgar Co.: E. W. Hart 4 (N). County undetermined: Kaminski s.n. [Gimli] (Wp); Leach s.n. [Caddy Lake] (Wp); C. W. Lowe s.n. [Grand Beach] (Wp, Wp). SASKATCHEWAN: Assiniboia: Boivin & Dore 8000 (N). Wadenai: S. E. Clarke s.n. [July '39] (Sk). District undetermined: Bourgeau s.n. [1857--8] (S). BRITISH COLUMBIA: Yale Co.: W. B. Anderson s.n. [Aug. 8, 1917] (Pl—45404). County undetermined: J. Fletcher 1303 [Kelowna] (Mg). VANCOUVER ISLAND: J. R. Anderson s.n. [21 Aug. 1905] (Pl—45521, Pl—45522); W. R. Carter s.n. [Alberni, July 1916] (I), s.n. [Alberni, Sept. 1916] (Po—179931); Macoun s.n. [Aug. 12th 1887] (C). MAINE: Androscoggin Co.: E. D. Merrill 757 (W—414487). Aroostock Co.: G. D. Chamberlain s.n. [Washburn, Sept. 2, 1940] (Ca—882649); Fernald s.n. [Aug. 5, 1893] (S); True 6250 (Up); E. P. Walker 1364 (Up). Cumberland Co.: E. B. Chamberlain s.n. [Cumberland, 1 Aug. 1901] (W—491252); H. N. Moldenke 18898 (Es, N, Or, Se, Si, Up). Hancock Co.: Strobel s.n. [Blue Hill, 1892] (Um—234). Oxford Co.: F. W. Johnson 248 (N); True 1474 (Up). Penobscot Co.: Harvey & Harvey 757 (W—606267); Hiland s.n. [above Old Town, VII-23-1929] (La), s.n. [n. of Orono, VII-23-1929] (La); L. P. Hynes

1371 (Up). Piscataquis Co.: Fernald 296 (C, W-278475). Waldo Co.: Friesner 9092 (Bt-27853, Bt-27854). York Co.: Cléonique-Joseph 2954 (Vi); F. T. Hubbard s.n. [Seabury, Aug. 15, 1901] (Rf); Parlin 1372 (Hi--22995); True 275 (We), 2756 (Up). NEW HAMPSHIRE: Belknap Co.: True 290 (Up). Carroll Co.: Pierce s.n. [August 19, 1889] (Du--24182). Cheshire Co.: Ottley 5750 (Go). Coos Co.: A. H. Moore 4062 (Up); Pease 35A60 (Hi-199501). Grafton Co.: Bowen 435b (Up); W. V. Brown 1928 (H-63336); C. H. Hitchcock s.n. [Hanover] (Dt); Langdon s.n. [Campton, July 25, 1893] (Mi). Hillsboro Co.: Batchelder 2113 (Dt); H. N. Moldenke 19024 (Es, N, Or, Ot, Se, Si, Sm, Up). VERMONT: Bennington Co.: M. A. Day 149 (Vt, W-348488). Caledonia Co.: F. Blanchard s.n. [Barnet, July 1884] (Ca-192068), s.n. [Barnet, Aug. 1886] (Dt); Grover s.n. [July 24, 1890] (Ob-50799). Chittenden Co.: Core, Frye, & Core 4811 (We); Dole 111 (Vt), 501 (Vt); F. A. R. s.n. [Burlington, July 23, '03] (Vt); Grout s.n. [Burlington, July 24, '91] (Vt); Herb. Univ. Vermont s.n. [Burlington, July 7, 1907] (Vt); Pringle s.n. [Essex, 18 August 1876] (Vt), s.n. [Charlotte, 29 August 1878] (Vt). Franklin Co.: Pease 38488 (Hi-199242). Orange Co.: J. F. Reed s.n. [Fairlee, Oct. 22, 1931] (H-27587). Rutland Co.: Banker 280 (N); Carpenter s.n. [8/13/05] (Vt), s.n. (La); D. L. Dutton s.n. [Brandon, Aug. 10, 1910] (Vt), s.n. [Brandon, July 7, 1921] (Cm), s.n. [Brandon, July 9, 1921] (Um-221, Va); Eggleston s.n. [Rutland, 8-90] (Dt); Osborn s.n. [Pittsford, July 20, 1880] (Pu). Windham Co.: H. N. Moldenke 9886 (Ur); Moldenke & Moldenke 9886 (Go, N). Windsor Co.: F. Blanchard s.n. [W. Windsor, 1873] (Dt); Chivers & Poole s.n. [Norwich, 7/19/39] (Go); Loveland s.n. [Norwich, 7-28-1875] (Vt); Roller s.n. [Plymouth, 7/15/36] (Nj). County undetermined: E. Brainerd s.n. [10 Aug. 1879] (Vt); Collector undesignated s.n. [Lk. Champlain, Aug. 17, 1881] (Vt); Dike s.n. [August] (Vt); Herb. Univ. Vermont 9589-17 (Vt). MASSACHUSETTS: Barnstable Co.: Beetle 534 (Pl-81424); Fernald 669 (W-1885809); Fernald & Long 19032 (Al); Fogg 563 (Up-82439), 3593 (Up, Up); J. P. Poole s.n. [Mashpee, 8/18/39] (Go). Berkshire Co.: Churchill s.n. [Lanesboro, July 19, 1915] (Ba); Herb. Torrey s.n. [July 1828] (T); Jones & Jones 15344 (Ur); Moldenke & Moldenke 11673 (Go, N); C. L. Pollard s.n. [Great Barrington, Aug. 1893] (W-309645). Bristol Co.: O. Ames s.n. [North Easton, July 28, 1893] (Rf); Blomberg s.n. [August 1903] (S). Dukes Co.: Fogg 2465 (Up); F. M. Jones s.n. [August 17, 1940] (Up); F. C. Seymour 1324 (H-107712). Essex Co.: J. Blake s.n. [8.1882] (S); Chivers s.n. [Amesbury, July 7, 1902] (Dt, Dt, Dt); S. S. Clark 263 (La), 263a (La); A. H. Moore 121 (Io-131755); Morong s.n. [Jul. 28, 1868] (N); K. L. Powell s.n.

[Ipswich, Aug. 1, 1921] (Sd--5965). Franklin Co.: H. N. Moldenke 8846 (N); R. E. Torrey s.n. [July 20, 1910] (Ms). Hampden Co.: R. H. Piper 1341 [Dorwart or Herb. Amherst Coll. 68337] (Ok); F. C. Seymour 511 (H--107713, Ms, N). Hampshire Co.: Barlow s.n. [Amherst, July 11, 1905] (Ms); A. Clark s.n. [Amherst, August 1875] (Ms); Ewer s.n. [Amherst, 7/11/28] (Ms, Ur); Goodale s.n. [North Hadley, 31 July 1926] (H--107715); Jesup 1956 (Dt); Peabody s.n. [Amherst, July 1874] (Sd--4253); C. S. Plumb 395 (Ms); F. C. Seymour 2869 (H--107714); R. E. Torrey s.n. [Amherst, 8-22-11] (Ms). Middlesex Co.: H. H. Bartlett 242 (Mi); F. S. Beattie 14409 (Es), s.n. [Aug. 8, 1927] (Or--20970), s.n. (Po--146577); A. H. Clark 160 (Gg--31327); Cushman s.n. [Middlesex Fells, July '89] (Up--69671); W. Deane s.n. [Aug. 31, 1912] (Dt); G. B. Grant 6111 (Po--267625); Grover s.n. [July 26, 1895] (Ob--50793); F. C. Seymour s.n. [Waverley, July 24, 1908] (H--107716). Suffolk Co.: Blazie s.n. [July 1922] (Gg--31329); Boot s.n. [Boston, 1816] (S); Churchill s.n. [Dorchester, Oct. 1, 1898] (Ba); Girard s.n. [Cambridge, aout '48] (Bm); E. L. Greene s.n. [Boston, 25 aout 1833] (Du--166435). Worcester Co.: W. V. Brown 3083 (Au); W. F. Carr s.n. [West Sterling] (Se--14937); Hathaway 681 (S); R. H. Piper 524 (Ok), 1177 (Ok). Martha's Vineyard: MacKeever MV.402 (Gg), MV.402a (Gg); F. C. Seymour 1324 (N). Nantucket Island: E. P. Bicknell 7339 (N), s.n. [Sep. 2, 1904] (N); MacKeever N.286 (N, Um, Z). Uneatena Island: D. S. Francis 37 (Ok). County undetermined: J. Lund s.n. [Edgeworth, Aug. 11, 1882] (Ok); J. Torrey s.n. [1833] (Br). RHODE ISLAND: Kent Co.: H. N. Moldenke 19038 (B, Es, F, Fy, Mg, Mr, N, No, Or, Ot, S, Se, Si, Sm, Ss, Up). Block Island: P. Spaulding s.n. [Block Island, Aug. 9, 1916] (Gg--31323, W--1118326). County undetermined: A. Gray s.n. [1848] (S). CONNECTICUT: Fairfield Co.: J. H. Barnhart 54 (N); Bisailon 70 (Um--51566); S. C. Brooks s.n. [Greenwich, August 25, 1908] (Ca--377695); Jesup s.n. [Westport, Aug. 1850] (Dt); C. L. Pollard 186 (W--309642); P. Wilson seed 347 (N). Hartford Co.: M. Brandege s.n. [Berlin] (Ca--468124); H. C. Cowles s.n. [Sept. 13, 1892] (Ob--50794). Litchfield Co.: J. Dwyer 2388 (N); Meredith s.n. [Aug. 2, 1927] (S). Middlesex Co.: W. R. Hunt s.n. [Essex, July 15, 1922] (Au). New Haven Co.: W. W. Denslow s.n. [New Haven] (Ms); Kleeberger s.n. [New Haven, July 1874] (Gg--31331); J. W. Wood s.n. [July 1864] (Ms). New London Co.: Jansson s.n. [Sept. 10, 1927] (S), s.n. [Groton, July 16, 1929] (Go), s.n. [Groton, July 18, 1929] (Au), s.n. [Groton, July 28, 1929] (Ew), s.n. [Groton, Aug. 20, 1929] (Um--223), s.n. [Lyme, Aug. 18, 1957] (Go); K. P. Jons son s.n. [Groton, July 17, 1928] (Io--135364); Lumsden s.n. [Aug. 7, 1884] (Ob--50801); W. A. Setchell s.n. [Norwich, July 10, 1883] (Ca--25183). Windham Co.: J. L. Sheldon s.n. [Central Village,

June 1903] (We). County undetermined: Herb. Gray s.n. (S); C. Wright s.n. (Cm). NEW YORK: Albany Co.: H. D. House 19599 (Al); Whitney 654 (Al), 1097 (Up). Bronx Co.: Ahles 505 (Aa), 777 (Aa); E. P. Bicknell 7341 (N), 7341a (N), 7342 (Al), 7344 (N), 7346 (Nj); Clute s.n. [Bronx Park, July 21, 1898] (Bt--22923), s.n. [Pelham Park, July 12, 1899] (N); Gilly 105 (N); Holtzoff s.n. [McLean's Wood] (N); L. Johnson s.n. [Wmsbridge, Aug. 1, 1876] (Lh). Cattaraugus Co.: Alexander & House 12481 (Al), 13005 (Al). Chautauqua Co.: G. B. Grant 530 [3059] (Po--267672); Southworth s.n. [Forestville, Aug. 17, 1885] (Mi). Chemung Co.: Munz 173033 (S). Chenango Co.: E. E. Davis 6 (Al), 82 (Al), 129 (Al), 1028 (Al), 1088 (Al), 1119 (Al). Clinton Co.: Whitney 1994 (Al). Columbia Co.: McVaugh 1407 (Al, Up), 14767a (Mi); Moldenke & Moldenke 11745 (N), 19527 (Sm); C. H. Peck s.n. [Boston Corners] (Al); W. A. Weber 1414 (B1--48178, Io--152915). Cortland Co.: A. R. Moldenke 1 [H. N. Moldenke 20416] (N); C. H. Peck s.n. [Marl Pond] (Al). Delaware Co.: Ferguson, Ennis, & Ottley 2685 (Me), s.n. [Ottley 2685] (Io--127769); Ottley 2685 (Me); N. Taylor 792 (N); P. Wilson s.n. [Arkville, July 18, 1915] (Al, N). Dutchess Co.: B. Sherwood s.n. [road to Wingdale, Aug. 7] (Sh, Sh, Sh); Standley & Bollman 11943 (W--895512). Erie Co.: G. W. Clinton s.n. [Buffalo] (Pr); Mellor & Shafer 1066 (Cm). Essex Co.: Bowen 126b (Up); Britton & Britton s.n. [Sept. 15th, 1900] (N); H. D. House 15156 (Al), 28243 (Al); Wilde s.n. [Hurricane, 8/15/37] (Nj). Fulton Co.: W. D. Day s.n. [Stratford, Aug. 1871] (Pa). Genesee Co.: Muenschler & Brown 21403 (It). Greene Co.: N. Taylor 1020 (N), 1184 (N). Herkimer Co.: Folwell 512 (It); W. H. Rhoades s.n. [Little Falls] (Hs). Jefferson Co.: Keyes s.n. [Wattertown, July 1889] (Ca--199029); Muenschler & Maguire 2500 (Ca--513006); True 926 (Up). Kings Co.: Ruger s.n. [East Williamsburgh] (Tc). Lewis Co.: Hotchkiss 871 (Al). Madison Co.: Haberer 2748 (W--1200262); Maxon s.n. [near Breese's Woods, July 26, 1895] (W--674569). Monroe Co.: Barss s.n. [Rochester, 7 September 1909] (Or--8862); Holger s.n. [July 1863] (Al); W. A. Matthews 3154 (Hi--29791, La); A. R. Moldenke 8 [H. N. Moldenke 20436] (N, No); W. H. Rhoades s.n. [Rochester, Aug. 1934] (N). Nassau Co.: W. C. Ferguson 7145 (N), 7194 (N). Niagara Co.: Frazier s.n. [Niagara Falls, Aug. 1915] (Io--76670); E. C. Townsend s.n. [July 25, 1891] (Pl--86887). Oneida Co.: Haberer 677 (Al), 2747 (Al); H. D. House s.n. [July 13, 1916] (Al), s.n. [Aug. 17, 1917] (Al). Onondaga Co.: G. T. Hastings s.n. [Tully, July 24, 1895] (N); Straub s.n. [p. Syracuse] (W--317094). Ontario Co.: A. R. Moldenke 6 [H. N. Moldenke 20434] (Mr, N). Orange Co.: H. M. Denslow s.n. [Goshen] (N); Raup 7656 (Mi, N). Orleans Co.: Lennon s.n. [July 1893] (Al). Oswego Co.: Hotchkiss 3059 (Al); O. E. Pearce s.n.

[N. Hannibal, July 5, 1884] (W—147577); C. S. Sheldon s.n. [July 20, 1878] (Al). Otsego Co.: F. W. Johnson s.n. [Cherry Farm, Aug. 27, 1921] (N). Putnam Co.: H. N. Moldenke 19530 (Ot); Moldenke & Moldenke 11853 (N). Queens Co.: W. C. Ferguson 7732 (N); Hexamer & Maier s.n. [Willet's Neck, L. I., July 9, '53] (Cm). Rensselaer Co.: Banker 1395 (N); Puissant s.n. [West Troy, July 28, 1865] (Br), s.n. [Troy] (Br, I). Richmond Co.: Hollick s.n. [July 15th 1879] (Tc). Rockland Co.: Lucian 348 (Wl). Saint Lawrence Co.: Muenschler & Maguire 1092 (Ua—11387); Mrs. O. P. Phelps 799 (Gg—31324). Saratoga Co.: Collector undesignated 340 (Cm), s.n. [Saratoga Springs, 7/12/95] (Lh); H. D. House 13285 (Al). Schenectady Co.: H. N. Moldenke 19522 (Es). Schoharie Co.: H. N. Moldenke 19518 (Es). Schuyler Co.: McCarthy s.n. [Watkins, July 1887] (W—147575), s.n. [Watkins, Aug. 1887] (W—219417). Steuben Co.: A. R. Moldenke 11 [H. N. Moldenke 20460] (N). Suffolk Co.: Benson 7286 (Po—267627); S. L. Clarke s.n. [Quegue] (N); Disbrow s.n. [East Hampton] (Nm); H. W. Graham s.n. [Deer Pond, July—Aug. 1926] (Cm); L. K. Henry s.n. [Deer Pond, July 1929] (Cm), s.n. [Long Pond, July 1929] (Cm); Latham 38 (Al); Muenschler & Curtis 6430 (Al); C. Skottsberg s.n. [Montauk, 10/8/1926] (Go). Sullivan Co.: Eiten & Jensen 1463 (N); W. A. Weber 208 (Bl—48179, Io—150795). Tioga Co.: A. R. Moldenke 2 [H. N. Moldenke 20420] (N). Tompkins Co.: L. H. Bailey s.n. [Ithaca, Apr. 10, 1919] (Ba), s.n. [Ithaca, July 27, 1925] (Ba, Ba, Ba); Hoisington 47 (Ok—15640), 160 (Ok—15659); H. S. Jackson s.n. [McLean, July 2, 1904] (H—107717); J. M. R. s.n. [July 15, 1926] (Gu—E.1051); M. T. Lee s.n. [Enfield, July 1898] (N); Lennon s.n. [July 23, 1896] (Al); Locke s.n. [Fall Creek, Sept. 19th, '79] (Fc), s.n. [Ithaca, Sept. 25th, '79] (Fc); B. Maguire 6662 (Ua—26812); A. R. Moldenke 3 [H. N. Moldenke 20426] (Mg, N), 5 [H. N. Moldenke 20428] (N); Muenschler & Bechtel 340 (Ba, Io—113450, Pl—62605); Munz 617 (Po—64682); E. L. Palmer 1016 (S); O. E. Pearce s.n. [Ithaca, July 28, 1885] (W—218874); H. E. Summers s.n. [near Ithaca] (Io—73663); K. M. Wiegand s.n. [Ithaca, July 24, '96] (Se—36931); Woglum s.n. [Ithaca Flats, July 22, 1904] (Po—218028, Po—218029, Po—219333). Ulster Co.: Elting 2071 (Al); Macfarlane s.n. [Phoenicia Valley] (Up—46487). Warren Co.: Margolin 84 (We). Washington Co.: S. H. Burnham s.n. [August 1912] (Al); Dobbin 192 (Al); J. A. Drushel 6351 (Ur); A. Fitch s.n. [East Greenwich, 1865] (Mi), s.n. [East Greenwich, 1867] (Mi); H. D. House 29386 (Al, Ok); Jelliffe s.n. [Huletts, July '87] (C). Wayne Co.: H. N. Moldenke 20449 (N). Westchester Co.: E. P. Bicknell 7340 (Al, N); Collector undesignated s.n. [Tarrytown, Aug. 3, '96] (N); H. A. Gleason Jr. 1452 (Go, N, S); Mackness

s.n. [July 20, 1937] (Tl); H. N. Moldenke 19091 (N, Or); F. W. Pennell 6681 (N). Wyoming Co.: Herb. Univ. Ill. s.n. [Wyoming, Aug. 4, 1859] (Ur). Yates Co.: A. R. Moldenke 10 [H. N. Moldenke 20448] (N, S); W. S. Phillips 221 (Al); S. H. Wright s.n. (Mm—15403). County undetermined: Broume s.n. [1848] (S); Collector undesignated s.n. [July 15, 1896] (N), s.n. [August 25, 1896] (N); F. C. Ferguson s.n. [Plattsdale, L. I., 7-18-19] (N); J. M. R. s.n. [Renwick, July 26, 1926] (Gu—E.1050); Ottley 16594 (Kr); Ruger s.n. (Tc); J. Torrey 746 (Al, Al), s.n. (Pa). NEW JERSEY: Atlantic Co.: H. N. Moldenke 21876 (Fg); W. Stone 12057 (Up). Bergen Co.: Dautun s.n. [Fairview, Aug. 2, 1903] (La); G. T. Hastings s.n. [Forest View Landing, Sept. 5, 1917] (N); K. D. Kimball s.n. [Moonachie, Aug. 12, 1916] (N); Niederer s.n. [Carlstadt, July 26, 1883] (N); Rydberg s.n. [Ft. Lee, July 30, 1921] (Po—174819, Um—203); Walter s.n. [Ridgefield, July 27, 1879] (N). Burlington Co.: Fogg 9212 (Up); H. A. Green s.n. [Medford, 1881] (Cm); W. Stone 12935 (Up). Camden Co.: Fogg 9200 (Up); L. P. Hynes 1439 (Up), s.n. [July 15, 1937] (Up); C. F. Parker s.n. [1860] (Pr); E. S. Steele 98 (W—1521027). Cape May Co.: Fender 809 (Up); Fogg 9406 (Up); G. B. Grant s.n. [Ocean City, 16 July '05] (Po—267673); W. Stone 10205 (Up), 10330 (Up), 11866 (Up), 16314 (Up). Cumberland Co.: W. Stone 13251 (Up). Essex Co.: Lighthipe s.n. [Upper Montclair, Aug. 13, 1914] (Au). Gloucester Co.: Brinton s.n. [Westville, July 29, 1888] (Up—17104); Fogg 9442 (Up); Lippincott s.n. [Richardsons, Sept. 1889] (Up), s.n. [Richardsons, 8-30-91] (Up). Hudson Co.: Kearney s.n. [New Durham, Aug. 24, 1894] (C); J. Torrey 125 (W—264611); Von Rabenau s.n. [Herb. Osten 13023] (Ug). Hunterdon Co.: H. L. Fisher s.n. [Stockton, 7-18-97] (Ur). Mercer Co.: Collector undesignated s.n. [Princeton, 2 Aug. 1876] (Pr); Macloskie s.n. [Princeton] (Pr). Middlesex Co.: J. A. Kelsey 173 (Mi, Ua—11386, Ua—27138, We), s.n. [Halsted 173] (C, Fc, Io—15348, Vt); H. N. Moldenke 19141 (Or); J. A. Small s.n. [Cheesequake, 7/24/39] (Nj); Thais s.n. (Mt); Vail s.n. [New Brunswick, July 18th, 1890] (N). Monmouth Co.: Brinton s.n. [Sea Girt, Aug. 27, 1891] (Ca—25181); Dautun s.n. [Cherry Hill, 2 Aout 1908] (La); H. N. Moldenke 21731 (Sm). Morris Co.: G. V. Nash s.n. [Sept. 5, 1898] (N); True 758 (Up), 2246 (Up). Ocean Co.: Fogg 11064 (Up), 11114 (Up), 11166 (Up); Harshberger s.n. [Seaside Park, July 21, 1900] (Up—43614); L. P. Hynes s.n. [September 11, 1938] (Up); J. A. Small s.n. [Island of Long Beach, 13 Sept. 1936] (Nj). Passaic Co.: Disbrow s.n. [Greenwood Lake, July '08] (Nm); H. N. Moldenke 21878 (Fg); G. V. Nash s.n. [Clifton, Sept. 4, 1892] (Ka, Lh). Salem Co.: Adams & Adams 1708 (Up); Fogg 7463 (Up), 9566 (Up). Somerset Co.: H. N. Moldenke 1339 (E, Go, H—5471, N, N, S, Up, Ur), 2061 (N), 7400 [Pl. Vic. N. Y. City 40]

(Go, N, Um—232, Ur), 8090 (Go, N, S), 20308 (Wh); Shetler 292/1 (N); Sumner s.n. [Bernardsville, Aug. 17, 1897] (Bl—42324). Sussex Co.: Adams, Adams, & Wherry 1521 (Ca—588546); Fogg 12535 (Up); Lisi 185 (Up); K. K. Mackenzie 833 (N); H. N. Moldenke 21551 (Ss); G. V. Nash s.n. [July 16, 1909] (N); H. H. Rusby s.n. [Franklin, July 26, 1873] (Mi), s.n. [Franklin, Aug. 1879] (Mn—16086); Witte s.n. [Aug. 9, 1932] (Up). Union Co.: P. Clarke s.n. [Great Island, Aug. 2, 1902] (N, N); Kezer s.n. [8/6/36] (N). County undetermined: Harshberger s.n. [New Jersey, July 1889] (Up—2153); Paddock s.n. [1838] (Ur); O. E. Pearce s.n. [N. J., 1884] (W—218873); W. Stone 3467 [Cateksin Camp] (Up); J. W. Wood s.n. [Aug. 1842] (Ms). PENNSYLVANIA: Allegheny Co.: Bright 55 (Cm); O. E. Jennings s.n. [Aug. 22, 1907] (Cm), s.n. [Aug. 27, 1921] (Cm), s.n. [8-21-43] (Cm); Shafer s.n. [July 22, 1900] (Cm), s.n. [Aug. 5, 1900] (Cm). Armstrong Co.: J. M. Fogg 15349 (Up); O. E. Jennings s.n. [Sept. 27, 1904] (Cm). Beaver Co.: Andriessen s.n. [July 1881] (Cm); O. E. Jennings s.n. [Sept. 10, 1906] (Cm), s.n. [Oct. 9, 1921] (Cm). Bedford Co.: Berkheimer 996 (Up), 7583 (Mi); O. E. Jennings s.n. [Oct. 9, 1904] (Cm), s.n. [8/10/1941] (Cm); Q. King s.n. [Aug. 11, 1937] (Cm); Mrs. A. B. Lord s.n. [July—Aug. 1919] (Cm). Berks Co.: Collector undesignated s.n. [prope Reading, 1832] (M); H. N. Moldenke 19372 (N, Or). Blair Co.: Mellor s.n. [July 12th '89] (Cm); Shafer s.n. [July 13, 1889] (Cm). Bradford Co.: O. E. Jennings s.n. [Aug. 21, 1929] (Cm); H. N. Moldenke 17080 (Br, Ml, Nd, Se, St); W. Rhoades s.n. [near Grover, July 1933; H. N. Moldenke 17080] (Bt, Bt—29941, N); H. A. Wahl 17597 (Hi—168734); Westerfeld 817 (Cm). Bucks Co.: Dreisbach 3684 (Mi); MacElwee s.n. [July 22, 1893] (N); McDowell 453 (Up); O'Neill s.n. [August 16, 1930] (I). Butler Co.: Bright s.n. [Aug. 2, 1924] (Cm); J. M. Fogg 15305 (Up); L. K. Henry s.n. [Aug. 1927] (Cm), s.n. [9/16/40] (Cm); O. E. Jennings s.n. [8/19/22] (Cm); Krouse s.n. [7/26/47] (Hi—133056); N. Russell H. 3961 [NR.2355] (We). Cambria Co.: O. E. Jennings 17 (Cm), s.n. [July 24, 1908] (Cm); W. Stone 8870 (Up). Cameron Co.: J. M. Fogg 11538 (Up), 18096 (Up); Jennings & Jennings s.n. [Aug. 20, 1925] (Cm); H. A. Wahl 831 (Up, Ur). Centre Co.: M. T. Travis 714 (Up), 1787 (Up); Westerfeld 648 (Cm). Chester Co.: T. W. Edmondson 6337 (N); F. W. Pennell 12262 (N); M. T. Travis 591 (Up). Clarion Co.: O. E. Jennings s.n. [July 21, 1904] (Cm), s.n. [Sept. 5, 1921] (Cm). Clearfield Co.: J. M. Fogg 15436 (Up); O. E. Jennings s.n. [July 12, 1908] (Cm). Clinton Co.: Wahl & Westerfeld 12097 (Ur). Crawford Co.: O. E. Jennings s.n. [Aug. 19, 1904] (Cm), s.n. [Aug. 4, 1909] (Cm); James A. Murray s.n. [Aug. 1, 1928] (Cm); Shafer s.n. [July 23, 1901] (Cm). Cumber-

land Co.: A. R. Moldenke 44 [H. N. Moldenke 21767] (Bm), 99 (Fg).
 Dauphin Co.: H. N. Moldenke 19369 (N). Delaware Co.: Eckfeldt s.
 s. [July 18, 1938] (Up); F. W. Pennell 14689 (N), 14754 (Cn, Fl--
 31477, H--56567, Io--153886, It, Um--235, Ur, We); W. Stone 552
 (Up), 3122 (Up); W. M. Thompson Jr. 328 (Up). Elk Co.: O. E. Jen-
 nings s.n. [July 19, 1904] (Cm). Erie Co.: Jennings & Jennings s.
 n. [7/26/1925] (Cm, Cm); N. H. Phillips 84 (Up), 205 (Up). Forest
 Co.: Kosinski s.n. [8/25/1940] (Cm). Franklin Co.: Collector un-
 designated s.n. [Concord, July 13, 1884] (Mi); H. N. Moldenke
 19167 (N). Fulton Co.: A. R. Moldenke 101 (Fg). Huntingdon Co.:
E. H. Graham s.n. [7/12/32] (Up); M. T. Travis 790 (Up); H. A.
 Wahl 1388 (Pl--129973, Ur). Indiana Co.: O. E. Jennings s.n.
 [July 11, 1908] (Cm); Shafer s.n. [Aug. 8, 1901] (Cm). Jefferson
 Co.: E. H. McClelland s.n. [8/7.10/22] (Cm). Juniata Co.: J. M.
 Fogg 15530 (Up). Lackawanna Co.: Charnell 569 (Up); Glownke 7772
 (We); Twining s.n. [July 15, 1907] (Cm). Lancaster Co.: Brubaker
 716 (Up), 1315 (Up); F. W. Pennell 13093 (Cm, N); Tanger 3333
 (Up), s.n. [July 28, 1937] (Up). Lawrence Co.: L. E. Fox 405 (Fx);
Henlen 60 (Cm); O. E. Jennings s.n. [Sept. 18, 1919] (Cm); Whit-
 tenberger s.n. [August 30, 1939] (Up). Lebanon Co.: C. H. Kauff-
 man s.n. [Lebanon, August 22, 1928] (Mi); H. N. Moldenke 19370
 (N). Lehigh Co.: O'Neill s.n. [Allentown, August 19, 1927] (Fl--
 21112, I). Luzerne Co.: Glownke 2875 (Up). Lycoming Co.: J. M.
 Fogg 11588 (Up), 17719 (N); W. R. Taylor s.n. [Essick Heights,
 1912] (Up--75580). McKean Co.: O. E. Jennings s.n. [July 21,
 1904] (Cm), s.n. [Sept. 6, 1937] (Cm). Mercer Co.: L. K. Henry 63
 (Cm); O. E. Jennings s.n. [Aug. 30, 1923] (Cm); Shafer s.n. [July
 17, 1902] (Cm). Monroe Co.: Bernhardt s.n. [Paradise Falls, Aug.
 18, 1928] (Mi, Up); Gress, Jennings, & Jennings s.n. [Tobyhanna]
 (Cm); Henry & Graham s.n. [Aug. 1930] (Cm); Jennings, Jennings, &
 Gress s.n. [Aug. 1920] (Cm); Langman 1124 (Up). Montgomery Co.:
J. M. Fogg 9141 (Up); MacElwee s.n. [June 26, 1892] (N); Wisner
 547 (Up). Northampton Co.: Tyler 216 (Br), s.n. [Easton, July 14,
 1896] (N). Northumberland Co.: J. M. Fogg 18013 (Up). Perry Co.:
A. A. Heller 14222 (Du--157211, Se--84873); A. R. Moldenke 17 [H.
N. Moldenke 20489] (F); H. H. Travis s.n. [Sept. 5, 1938] (Up).
 Philadelphia Co.: Brinton s.n. [8.9.1878] (Pl--115520); I. Burke
 s.n. [Commons, Phil.] (Up--17108); Dreisbach 1702 (Up); MacElwee
 1074 (N); G. Watson s.n. [Philadelphia] (Ca--379996). Pike Co.:
Bartram s.n. [July 14, 1917] (Pl--70715); DePue 331 (Up). Potter
 Co.: Eimer 9 (Cm), s.n. [July 29, 1927] (Cm), s.n. [July 1928]
 (Cm); H. W. Graham 5 (Cm); H. N. Moldenke 19113 (N, Or). Schuyl-
 kill Co.: Arndt s.n. [Aug. 17, 1915] (Up); P. R. Wagner 668 (Up),
 2258 (Up), 4878 (Up), 5636 (Up), 7265 (Up). Snyder Co.: H. N.

Moldenke 20479 (N); Wade & Wade 1385 (Up). Somerset Co.: O. E. Jennings s.n. [Sept. 15, 1919] (Cm); B. H. Patterson s.n. [July 19, 1872] (Cm); Van Dersal s.n. [7/31/34] (Cm). Sullivan Co.: W. Stone 5877 (Up), 14710 (Up). Tioga Co.: Gress, Jennings, & Jennings s.n. [Sept. 2, 1920] (Cm); H. N. Moldenke 20466 (N). Union Co.: Will s.n. [8/15/36] (Cm). Venango Co.: Wurdack s.n. [9/6—7/42] (Cm). Warren Co.: O. E. Jennings s.n. [8/22/29] (Cm); Jennings & Bright s.n. [Iron Springs, 1928] (Cm); H. N. Moldenke 16605 (We), 17696 (Br). Washington Co.: Jennings & McKee s.n. [Aug. 10, 1919] (Cm, Up). Wayne Co.: Dix 125 (Up); Jennings, Jennings, & Gress s.n. [Aug. 21, 1920] (Cm). Westmoreland Co.: Block s.n. [July 1881] (Cp, I); Damsire s.n. [8/20/35] (Cm); L. K. Henry 551 (Ca—882656, Hi—192860, W—1810935), s.n. [7/29/37] (Cm), s.n. [9/11/40] (Cm); K. R. Holmes s.n. [July 13, 1902] (Cm); O. E. Jennings s.n. [8/30/19] (Cm), s.n. [Aug. 4—5, 1923] (Cm); Shafer s.n. [Aug. 15, 1900] (Cm). Wyoming Co.: Glowenke 862 (Up); A. D. Granger s.n. [Factoryville, 7/15/1894] (N). York Co.: F. E. Lloyd s.n. [Aug. 6, 1889] (Cm); W. Stone 2164 (Up). County undetermined: Eifrick s.n. [Mt. Lake Park, Aug. 25, 1901] (Cm); Schweinitz s.n. [Pennsylvania, 1829] (Br); C. W. Short s.n. [Pennsylvania] (Lu). DELAWARE: Kent Co.: E. L. Larsen 310 (Up), 1240 (Gu—13840, Up). New Castle Co.: E. L. Larsen 662 (Up). Sussex Co.: N. L. Britton 27 (N); R. R. Tatnall 4302 (Up). MARYLAND: Allegany Co.: Shriver s.n. [May 1894] (N). Baltimore Co.: Boldo 13 (Q). Caroline Co.: E. C. Earle 1566 (Up). Cecil Co.: W. L. Abbott 2448 [Herb. Leonard 4383] (W—2160460); H. N. Moldenke 13802 (Z). Garrett Co.: F. C. Lane 1721 (Ur, Ur); J. D. Smith s.n. [July 15, '98] (W—1323093). Hanover Co.: A. R. Moldenke 491 (Fg). Harford Co.: Shull 156 (N); Tanger s.n. [Aug. 4, 1937] (Up). Howard Co.: A. R. Moldenke 489 (Fg). Montgomery Co.: Tidestrom s.n. [Chainbridge, Oct. 1897] (I). Prince Georges Co.: T. Holm s.n. [Junil 1896] (I); Hyacinth 1457 (Gg—31321); A. R. Moldenke 492 (Fg); Petrak s.n. [20.VII.1950] (S), s.n. [27.VIII.1950] (S); True 558 (Up). Talbot Co.: E. C. Earle 1596 (Up), 1603 (H—52414). Washington Co.: A. R. Moldenke 40 [H. N. Moldenke 21761] (Bm). Worcester Co.: Redmond 198 (I). DISTRICT OF COLUMBIA: F. Blanchard s.n. [near Long Bridge, 11 July 1891] (Dt, N); Canby s.n. [D. C., 1881] (Fc—716); T. Holm s.n. [18/7/1911] (I, S); Kearney s.n. [Aug. 8, 1897] (N); E. C. Leonard 466 (Cp); F. H. Sargent 7608 (Go); E. S. Steele s.n. [July 16, 1896] (Ob—50806); Wismer 368 (H—24409, Up). VIRGINIA: Charles City Co.: A. R. Moldenke 490 (Fg). Fairfax Co.: Killip 36681 (N). Fauquier Co.: Allard 3281 (W—1734757). Floyd Co.: A. R. Moldenke 48 [H. N. Moldenke 21772] (Bm). Frederick Co.: P. Schallert Jr. s.n. [Winchester, 8/27/38]

(Ky). Giles Co.: J. M. Fogg 13011 (Up). Grayson Co.: Radford & Radford 2613 (Hi--35271). James City Co.: Artz 1131 (Up). Loudoun Co.: A. R. Moldenke 68 [H. N. Moldenke 21793] (Bm). Montgomery Co.: R. Kral 9594 (Hi--201637); Murrill s.n. [Blacksburg, August 1894] (Io--30879). Patrick Co.: A. R. Moldenke 49 [H. N. Moldenke 21773] (Bm). Roanoke Co.: Fauntleroy 659 (W--694518); H. N. Moldenke 19248 (N); C. E. Wood 6239 (Hi--51277). Smyth Co.: A. R. Moldenke 60 [H. N. Moldenke 21785] (Bm); J. K. Small s.n. [St. Clair's Bottom, July 30, 1892] (C, Ca--25182, Up--17106, W). Washington Co.: A. R. Moldenke 58 [H. N. Moldenke 21783] (Bm). Wythe Co.: A. R. Moldenke 62 [H. N. Moldenke 21787] (Bm). WEST VIRGINIA: Barbour Co.: A. H. Moore 2569 (Po--145245). Berkeley Co.: A. R. Moldenke 47 [H. N. Moldenke 21770] (Bm). Cabell Co.: F. A. Gilbert 1000 (We). Fayette Co.: L. W. Nuttall 345 (We); Smithson s.n. [14 July '36] (We). Hampshire Co.: Frye 1483 (We). Hancock Co.: Sumpstine s.n. [July 1938] (We); R. West 551 (We, We). Hardy Co.: E. L. Core 3758 (N); L. W. Wilson 138 (We), s.n. [July 20, 1943] (We). Kanawha Co.: Mrs. E. R. Yates s.n. [summer, 1940] (We). Mercer Co.: E. L. Core 1884 (H--33483); E. Dickinson s.n. [7/31/50] (We); Mrs. W. W. Dickinson s.n. [August 21, 1950] (We). Mineral Co.: M. Brown s.n. [Hartmansville, September 1952] (We). Monongalia Co.: Spangler 345 (We); Strausbaugh 345 (We). Nicholas Co.: E. A. Harrison s.n. [July 15, 1955] (We); Lyman s.n. [Fenwick, 8-14-79] (Dt). Ohio Co.: E. A. Bartholomew 53 (We, We), s.n. [August 15, 1934] (We); Guttenberg s.n. [July 9, 1878] (Cm). Pocahontas Co.: Clarkson & Clarkson 612 (We); E. L. Core 3540 (Ob--50795); Herb. West Virg. Bot. Exped. s.n. [July 29, 1930] (S). Preston Co.: Davis & Davis 1448 (We); J. L. Sheldon 1882 (We, We); Spangler 271 (We, We). Putnam Co.: E. L. Core 6463 (We). Raleigh Co.: Tosh 535 (Ca--661131, Ky, We). Randolph Co.: C. B. Clarkson 1775 (We). Summers Co.: Boone 250 (We); Tosh 77 (Ky). Tucker Co.: Allard 9070 (W), 9119 (W), 9233 (W--1872154), 11500 (W--1895058), 21683 (W--2134497); C. B. Clarkson 1478 (We); Davis & Davis 765 (We). Webster Co.: C. F. Millspaugh 583 (We). Wood Co.: W. M. Pollock s.n. [Aug. 7, 1897] (W--315367). NORTH CAROLINA: Ashe Co.: A. E. Radford 38460 (Hi--104888), 38677 (Hi--104889). Orange Co.: Radford & Stewart 200a (Hi--12597). Transylvania Co.: Blomquist 4712 (H--5454). Warren Co.: C. R. Bell 4367 (Hi--92861). Washington Co.: E. J. Alexander s.n. [7/28/23] (Hi--59483). Watauga Co.: Ahles & Duke 47708 (Hi--104890); Ashe s.n. [July 19] (Hi--59485). County undetermined: Ashe s.n. [mountains of N. C.] (W--327850). SOUTH CAROLINA: Charleston Co.: Gibbes s.n. [Summer, 1859] (N). GEORGIA: Chatham Co.: Nyst s.n. (Br). FLORIDA: Duval Co.: Curtiss s.n. [Jacksonville, 1881] (Oa). OHIO: Ashland Co.: H. N. Moldenke

12171 (Co--445, Da). Ashtabula Co.: I. E. Diehl s.n. [Rock Creek, July 3, 1901] (Ca--373442). Butler Co.: Bridge s.n. [7/30/11] (Cn); J. Ferguson s.n. [July 19, 1932] (Ob--80596). Champaign Co.: Demaree 11689 (Ca--591988, W--1632194); E. C. Leonard 1609 [Herb. Leonard 4350] (W--2162185). Clark Co.: F. P. Davidson s.n. [Springfield, July 1885] (Or--8861). Columbiana Co.: Nicely s.n. [New Garden, July 20, 1958] (We); E. Wilkinson s.n. [31 July 1887] (Ob--80594). Coshocton Co.: H. N. Moldenke 13149 (Co--1290), 13380 (Br, Co--1534, Da, Ec, Ml, Nd, Se, St). Crawford Co.: Benson & Yaussy 309 (Po--267071). Erie Co.: C. L. Booth s.n. [August 2, 1901] (Ob--75335); Friedel s.n. [near Huron, August 25, 1942] (We); Monosmith s.n. [July 13, 1900] (Ob--75337); York s.n. [Cedar Point, 8-1-1902] (Up), s.n. [Cedar Point, 8-3-1902] (Dp). Fairfield Co.: Horr s.n. [Pickerington, Sept. 7, 1833] (Io--15347). Franklin Co.: Condit s.n. [Westerville, July 25, 1909] (Ca--456152); E. B. Williamson s.n. [July 1897] (In). Hamilton Co.: E. L. Braun s.n. [July 10, '17] (Cn), s.n. [8/10/17] (Cn), s.n. [8/10] (Cn); R. Buchanan s.n. (Ll); M. Mohr 465 (Ll); C. W. Short s.n. [prope North Bend] (Bm). Hocking Co.: Demaree 11655 (Ca--591987). Holmes Co.: H. N. Moldenke 12024 (Co--376, Da), 12158 (Co--435, Da). Knox Co.: H. N. Moldenke 12118 (Co--414), 12172 (Co--446, Da). Lake Co.: H. C. Beardslee s.n. [Aug. 2, 1870] (Ob--80598). Licking Co.: H. L. Jones s.n. [Aug. 10, 1889] (Ob--80595). Lorain Co.: H. C. Cowles s.n. [Oberlin, July 21, 1893] (Mi, Ob--75333); M. E. Day s.n. [Aug. 29, '91] (Ob--99796); W. M. Dick s.n. [August 6, 1894] (Du--296882, Ob--75330); Grover s.n. [July 23, 1900] (Ob--75338); F. D. Kelsey s.n. (Ob--50802); Monosmith s.n. [Swift's Hollow, July 13, 1900] (Mn--18491, Um--215); E. W. Phillips s.n. [10/8/1892] (Cm); A. E. Ricksecker 286 (Ob--75339, Ob--75340), s.n. [Oberlin, July 19, 1894] (Se--28246, St--23390), s.n. [Oberlin, Aug. 6, 1894] (Ob--75332, W--217595), s.n. [Oct. 2, 1899] (Ob--75331); A. A. Wright 1 (Ob--75329), s.n. [July 30, 1889] (Ob--75334, Ob--75336). Lucas Co.: Sanford 1956 (S). Medina Co.: Fullerton s.n. [Aug. 7, 1939] (En). Miami Co.: Clevenger s.n. [Fletcher, Aug. 13, 1897] (W--1524139). Ottawa Co.: E. S. Ford 223 (It); J. C. Myers s.n. [July 29, 1940] (We), s.n. [July 31, 1940] (We). Richland Co.: J. C. Myers s.n. [August 7, 1940] (We); E. Wilkinson 8461 (Cm, La, Ob--80597). Wayne Co.: L. S. Hopkins 56 (Br); E. Wilkinson s.n. [W. Salem, July 31, 1887] (H--24538, Ok). Johnson Island: York s.n. [Johnson Island, 7-26-1902] (Up). County undetermined: Black 36-5881 (Be--46571), 36-7097 [Fonte] (Be--47802); Umbach 7111 [Magician Lake] (Ca--46112); York s.n. [Miller's Cove, July 18, 1904] (Up). ILLINOIS: Adams Co.: Brinker 3063 (Il--15879); Evers 799 (N, Ur), 802, in part (Ur); Evers,

Jones, & Jones 572 (Ur); A. B. Seymour s.n. [Northeast Turnpike, 20 June 1876] (H--106462); Wehmeyer 19 (Mi, Mi). Boone Co.: Fell & Fell F.46494 (Il--21282). Brown Co.: Winterringer 5253 (Il--35417). Cass Co.: Geyer s.n. [Beardstown, July 1842] (S, Vt); Winterringer 5154 (Il--35538). Champaign Co.: Dembski 67 (Ur); H. A. Gleason s.n. [Jl. 6, 1899] (Ur); Herb. Ill. Ind. Univ. 17459 (Ur); Jewett 435 (Mi); G. N. Jones 12708 (Ur), 12711 (Ur), 12715 (Ur), 12805 (Ur), 16557 (Ur), 16568 (Ur); Knibloe s.n. [Herb. Ill. Ind. Univ. 17460] (Ur); Perino s.n. [August 3, 1950] (Ur); Snyder s.n. [Urbana, July 1881] (Sd--4254); Taft s.n. [Champaign, 1876--79] (Ka); Waites s.n. (Ur--29661); Winterringer 472 (Ur). Clay Co.: Winterringer 2152 (Il--27043). Clinton Co.: Spillman 298 (Pl--22631). Coles Co.: Umbach 1145 (Ca--441525). Cook Co.: H. H. Babcock 9281 (Ba--23753), s.n. [Chicago, Jul. 18, 1874] (Sg--16090); Bakker s.n. [Riverdale, July 1912] (Sd--12753); R. Bebb 1686 (Ok), 2109 (Ok); H. R. Bennett s.n. [Barrington, August 24, 1957] (Go); Blatchford 2515, in part (Il--15820); S. A. Cain s.n. [southern Chicago, 1926] (Bt--2472, Bt--2475), s.n. [August 1926] (Bt--2465); Dixon & Gage 767 (W--609447); H. S. Fawcett s.n. [Berwyn, 9/1/03] (Io--28408); G. D. Fuller 2292 (Il--15880), 8090 (Il--15884); F. C. Gates 1871.2 (Ur), 1873 (Ur); Lansing 1399 (Ur); Munroe s.n. [Chicago] (Po--70996); Sherff 1850 (Ur); H. H. Smith 5993 (Up); E. S. Steele 106 (W--608865); L. F. Ward s.n. [Chicago, August 16, 1897] (W--298088); Waugh 411 (Ka); Wessén s.n. [Chicago, VII.1899] (Go). Crawford Co.: Ahles 4850 (Ur); Winterringer 3753 (Pl--29199). Cumberland Co.: Spooner s.n. [Hazel Dell] (Il--15872); Winterringer 3403 (Il--28729), 5879 (Il--33149). De Kalb Co.: P. B. Whitford s.n. [July 19, 1946] (Ur). Douglas Co.: G. N. Jones 17523 (Ur). DuPage Co.: G. D. Fuller 1706 (Il--15883); W. S. Moffatt 573 (Ur); Umbach s.n. [Naperville, July 23, 1897] (W--339479). Edwards Co.: Winterringer 4177 (Il--30075). Effingham Co.: Ahles 2606 (Ur, Ur); Winterringer 5877 (Il--22151). Fayette Co.: McDougall 91 (Ur); O'Dell 335 (Ur), 336 (Ur). Franklin Co.: Ahles 5525 (Ur); Winterringer 3522 (Il--28915). Henry Co.: Winterringer 5241 (Il--35458). Iroquois Co.: Winterringer 6537 (Il--34123). Jackson Co.: Fuller & Welch 268 (Il--15877), 903 (Il--15873), 1021 (Il--15875); J. W. Voigt 985 (Il--36535); G. Wilson 1021 (Ur). Jefferson Co.: Ahles 5496 (Ur); Winterringer 7784 (Il--37432). Jersey Co.: P. Jacobs 37 (Ur). Jo Daviess Co.: Ahles 4346 (Ur); Pepoon & Moffatt 255 (Ur); Winterringer 8156 (Il--37458). Kane Co.: V. H. Chase 9245 (Ur); E. W. Erlanson s.n. (Mi); Erlanson & Erlanson 1538 (Mi). Kankakee Co.: Fuller & Hungerford 130 (Il--35095); E. J. Hill 222.1878 (Ur); G. N. Jones 15936 (Ur), 16046 (Il--15855, Ur). Lake Co.: R. K. Brown 90 (Ur), 580 (Ur),

s.n. [Sept. 5, 1949] (Ur); F. C. Gates 3211 (Mi, Ur), 13494 (Ka--73469); Gleason & Shobe 161 (Ur); L. P. Richardson s.n. [August 15, 1955] (St). LaSalle Co.: G. D. Fuller 1797 (Il--15882); P. B. Whitford 311 (Il--32222). Lawrence Co.: Sivert s.n. [Sept. 14, 1952] (Ur); Winterringer 6191 (Il--33522). Lee Co.: V. H. Chase 5304 (Ur); Keithley 249 (Il--20017), 272 (Il--31488), s.n. [July 12, 1945] (Ur), s.n. [July 28, 1946] (Ur); Lyman s.n. [Amboy, 7-21-94] (Dt). Livingston Co.: G. D. Fuller 9149 (Il--15856, Ur). Logan Co.: Ahles 3050 (Ur). Macon Co.: R. G. Mills s.n. [Decatur, Aug. 10, 1939] (N). Marion Co.: Winterringer 5963 (Il--33306). Mason Co.: F. C. Gates 3887 (Ur). McHenry Co.: Nason s.n. [Algonquin, Aug. 6, 1878] (Ur), s.n. [Algonquin, Aug. 28, 1879] (Ur). McLean Co.: Winterringer 5071 (Il--35890). Montgomery Co.: Winterringer 3880 (Il--29176). Moultrie Co.: Winterringer 9107 (Il--39392). Ogle Co.: Blount 120 (Il--30843); A. L. Hills 3434-0 (Il--15876), 3452-0 (Ur), 3640-0 (Il--15858). Peoria Co.: Heading s.n. [1875] (Ur); F. E. McDonald s.n. [Peoria, July 1886] (Ur), s.n. [Peoria, July] (Ur). Perry Co.: I. L. Forbes s.n. [Duquoin, VIII-16-'27] (Io--129208); Steiner s.n. [July 1, 1948] (Ur); Winterringer 3945 (Il--29075). Piatt Co.: G. N. Jones 21634 (Ur); Winterringer 626 (Ur). Pope Co.: Rapp & Rapp 56 (N, Ur), 57 (N, Vi), 58 (Ur). Pulaski Co.: Winterringer 5992 (Il--33180). Richland Co.: Ridgway 1173 (Ur, Ur), 1174 (Ur); Scherer 406 (Il--26359, Ur). Saint Clair Co.: J. Neill 1299 (Il--24721). Saline Co.: Winterringer 3511 (Il--28927). Sangamon Co.: G. D. Fuller 5039 (Il--15863), 5330 (Il--15864), 5572 (Il--15867), 5593 (Il--15870), 5849 (Il--15861), 6099 (Il--15862), 6156 (Il--15868); H. N. Moldenke 21882 (S). Stark Co.: V. H. Chase 981 (Ur), s.n. [July 10, 1896] (Ur, Ur). Stephenson Co.: Ahles 4500 (Ur); Serf 9844 (Il--15857); Winterringer 8100 (Il--37535). Tazewell Co.: V. H. Chase 3229 (Al, Il--15878, N, Ur, Ur). Union Co.: G. D. Fuller 674 (Ur).

- - - - -

BOOK REVIEWS

Alma L. Moldenke

"The Growth of Plants", by G. E. Fogg, 288 pp. Penguin Books Inc., Baltimore 11, Maryland. 1963 \$1.65 paper back.

What an excellent elementary, modern, thorough, introductory text to the field of plant physiology this book is! The organization is unlike most standard texts in this field and is planned